Effective Pre-school and Primary Education 3-11 Project (EPPE 3-11)

A longitudinal study funded by the DCSF (2003 – 2008)

Tracking Pupil Mobility over the Pre-school and Primary School Period: Evidence from EPPE 3-11

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The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Education and Skills

Contents

Executive Summary

This report describes the 'tracking' of the EPPE 3-11 sample and then goes on to examine the possible influence of mobility on EPPE 3-11 children's cognitive progress and social/behavioural development over both the pre-school and primary school period. In the present research 'mobility' is defined as having changed pre-school or school centre at least once.

The aims of the research are:

- To determine possible means of reducing attrition in a longitudinal sample - tracking
- To identify any likely predictors of mobility, that is, whether mobile individuals share any defining characteristics;
- To investigate the effects of mobility when predicting children's cognitive and social/behavioural outcomes, controlling for other background factors;
- To investigate the effects of children's mobility in terms of the academic effectiveness of the schools attended and to which children moved.

Tracking

The EPPE 3-11 project recruited children from 141 pre-school settings in six English Local Authorities (LAs) at the age of 3+. The project then followed these children through their primary school careers until the end of KS2 in primary school (Year 6, age 11). By this point the EPPE 3-11 children were attending over 900 primary schools in over 100 English LAs. Tracking the EPPE 3-11 sample has been an on-going process which has not just taken place at the key points of transfer for children. Our experience during the pre-school and primary years has shown that our sample is a very mobile one.

The EPPE 3-11 research demands regular monitoring of children's cognitive and social/behavioural development at key time points. Assessments have been conducted at various time points to enable the team to plot individual learner 'trajectories' for all of the children in the study. During the last 10 years, EPPE 3-11 researches have successfully 'tracked' the whereabouts of the EPPE 3-11 sample ensuring that assessments are conducted at particular time points. Keeping track of the sample ('tracking') is an essential part of any longitudinal study. The EPPE 3-11 research demands regular monitoring of children's cognitive and social/behavioural development at key time points. Assessments have been conducted at various time points to enable the team to plot individual learner 'trajectories' for all of the children in the study. During the last 10 years EPPE 3-11 researchers have successfully 'tracked' the whereabouts of the EPPE 3-11 sample ensuring that assessments are conducted at particular time points. Successfully 'tracking' of the EPPE 3-11 sample has allowed us to keep in regular contact with the EPPE 3-11 children and their parents, as well as key school personnel. Compared to other similar studies (e.g. ALSPAC, The Millennium Cohort Study), EPPE 3-11 has been very successful in 'tracking' the sample and maintaining low attrition and high response rates from the children, families and schools in our study (see response rates).

The successful tracking of the EPPE 3-11 sample has enabled this 10 year longitudinal study to ascertain the whereabouts of the sample, maintain good relationships with families and schools, and promote excellent response rates. In addition, it has enabled

us to expand our work in looking at the effects of mobility on children's cognitive attainment and progress and social/behavioural development.

Mobility

In terms of the characteristics of mobile children, a clear difference was evident in level of social advantage, between families whose children moved between pre-school centres and those who moved in primary school. More advantaged families, defined in terms of mother's highest qualification, were more likely to move during pre-school; and those eligible for free school meals (FSM) less likely to move during pre-school. Mobility during Key Stage 1 (KS1 - 5-7 years old) of primary school had the reverse characteristic: those more socially disadvantaged, in terms of FSM and those with absent fathers, were more likely to move during KS1. Mobility during Key Stage 2 (KS2 - 8-11 years old) was also typified by social disadvantage but not to the same degree as during KS1.

Controlling for background characteristics and prior attainment the initial findings indicated little influence of mobility on children's cognitive progress during either the pre-school period, or KS1 period. However, by the end of KS2 there was evidence of an association between lower levels of progress in Mathematics in KS2 and mobility in the KS2 period.

The findings of the present research, in terms of mobility itself, are broadly consistent with previous research (Strand and Demie, 2006). Mobility, that is at least one change of school, either during pre-school or KS1 has little independent impact on cognitive outcomes, when both background and prior attainment are taken into account and when the estimate is made against a simple non-mobility group for the same period. Furthermore, the results of our multilevel analysis indicate that mobility itself, moving pre-school centre, is not a significant predictor of poorer academic progress. That is, for this sample, mobility does not empirically produce diminished or increased academic progress during the pre-school years.

There is evidence, however, that later mobility is associated with diminished social/behavioural outcomes, specifically Self-regulation and Pro-social behaviour at KS1 (age 7 years), and all social/behavioural outcomes at KS2 (age 10-11 years). While these diminished outcomes are associated with primary school mobility, it is not clear whether this is a causal relationship or whether mobility reflects unmeasured family characteristics that might mediate the association between mobility and social/behavioural outcomes. Possible unmeasured family characteristics that might be influential include parental personality such as being go-getting or achievement oriented or sub-cultural factors related to child achievement. Also movement might be job related, or due to family break down, or increase in family size. However, it is also possible that poor social behavioural development might dispose parents to move their child to another school.

Children who were mobile during pre-school were more likely to come from socially advantaged families and to attend a more academically effective primary school. By contrast, children who were mobile in KS1 were more likely to come from socially disadvantaged families and have been attending a primary school with a significantly lower academic effectiveness before moving school. The differences in initial school's academic effectiveness may help to explain the poorer progress in Mathematics by the end of Year 2 for the KS1 only mobility group, as no such difference was evident at entry to Reception. Furthermore, attendance at schools with relatively low academic effectiveness may also be a factor contributing to KS1 mobility itself. Mobility in primary

school may be a parental response to EPPE 3-11 children attending a less effective primary school at which children are under-performing, which is consistent with findings from our analyses of school effectiveness before after moves.

Introduction

Background

The Effective Pre-school and Primary Education Project 3-11 (EPPE 3-11) is a large scale longitudinal study funded by the Department for Children, Schools and Families (DCSF; 1997 - 2008) with the aim of investigating the influence of pre-school and primary school on children's cognitive and social/behavioural development. The first phase of the research followed children to the end of Key Stage 1 (KS1) of primary school (age 7 plus years). The second phase of the study has followed children's development to the end of Key Stage 2 (KS2) of primary school (age 11) in order to explore any continuing pre-school influences as well as to investigate the effects of primary school.

The research design used for the original EPPE study is described in detail in EPPE Technical Paper 1 (Sylva et al., 1999). In summary, six English Local Authorities (LAs), located in five regions of the country (chosen to be broadly representative of the national population), participated in the research with children recruited from six main types of pre-school provision: nursery classes, playgroups, private day nurseries, local authority day nurseries, nursery schools and integrated (combined care and education) centres. In order to enable comparison of centre and type of provision effects the project recruited 500 children, 20 in each of 20-25 centres, from the various types of provision. In some LAs certain forms of provision were less common and others more typical. Within each LA, centres of each type were selected by stratified random sampling and, due to the small size of some centres in the project (i.e. rural playgroups) more of these centres were included than originally proposed, bringing the sample total to 141 centres. In all, there were 2,857 children in the pre-school sample. As children moved from pre-school into a reception class in primary school a further 315 'home' children (who had not attended a pre-school setting) joined the study, bringing the total sample to 3,172.

The EPPE 3-11 is not a birth cohort study as the children were not all born in the same year. Our recruitment spanned four cohorts as follows:

Table 1: EPPE 3-11 sample by cohort

Cohort	Date of birth	Current Year	N	%
1	Sept 92 – Aug 93	10	202	6.4
2	Sept 93 – Aug 94	9	1267	39.9
3	Sept 94 – Aug 95	8	1588	50.1
4	Sept 95 – Aug 95	7	115	3.6
Total	-	-	**3172**	**100**

Part One: Tracking the EPPE 3-11 Sample

This part of the report addresses possible means for reducing attrition in a longitudinal sample and explains the processes that have been used to track the EPPE 3-11 sample from ages 3 to 11 years old.

Section 1: The necessity for 'tracking'

The EPPE 3-11 research demands regular monitoring of children's cognitive and social/behavioural development at key time points. Assessments have been conducted before and after the pre-school period, during Key Stage 1 (KS1 - 5-7 years old) and at the end of Key Stage 2 (KS2 - 8-11 years old) (see the cohort grid in Appendix 1 for more details). These assessments enable the team to plot individual learner 'trajectories' for all of the children in the study. The EPPE 3-11 team has been successful in reporting on the factors which influence and impact on children's development. The findings have been used to inform policy in pre-school at national level through the Sure Start agenda (DCSF), several Spending Reviews (Her Majesty's Treasury) and most recently through the work of the Equalities Review Team (The Cabinet Office).

Keeping track of the sample ('tracking') is an essential part of any longitudinal study. It is essential to the project that assessments are conducted at particular time points, with the 'window' for some assessments being very small e.g. all Year 5 assessments had to be conducted during the second half of the spring term. In order to ensure comparability of data and to enable Year 5 teachers to conduct the assessments efficiently it is extremely important that we know the whereabouts of every child in the study. In addition, it saves time and money because it reduces the number of assessments that need to be re-sent to schools. Compared to other similar studies (e.g. ALSPAC, The Millennium Cohort Study), EPPE 3-11 has been very successful in 'tracking' the sample and maintaining low attrition and high response rates from the children, families and schools in our study (see response rates).

During the last 10 years researchers have successfully 'tracked' children's whereabouts and this has enabled us to remind parents of the project outside of assessment periods (when they have direct input into the research). It has also helped to keep 'key' school personnel (heads and admission administrators) committed to the project and feel part of research that has informed policy and practice.

In addition to the main study, EPPE 3-11 was commissioned in 2006/2007 to undertake a sub-study focussing on the transition between primary and secondary school (Evangelou, Taggart, Sylva, Melhuish, Sammons & Siraj-Blatchford, 2008a; 2008b). This sub-study would not have been possible without the accurate tracking of children to secondary schools. The Transitions project set out to explore the experiences of changing schools at key transition points. The study investigated factors related to good transition experiences for pupils, parents, teachers and local authority personnel. The study combines quantitative data derived from questionnaires and qualitative information from semi-structured interviews. The interview data were combined (pupils, teachers and LA personnel) to produce evidence from case studies of good transitions. The sub-study focuses on those pupils who transferred from primary to secondary school in September 2007: Cohort 3 (see Evangelou et al., 2008a; 2008b for full details)

Recently our tracking has paid particular attention to Cohort 2, to ensure their whereabouts is known for assessments in the third phase of the study: Effective Pre-school, Primary and Secondary Education Project (EPPSE 3-14), and to Cohort 4 after their transition to secondary school. Tracking involves various stages to ensure we know the physical whereabouts of children/families. In addition, there are additional social factors associated with tracking the EPPE 3-11 sample, which include, contact with Social Services, Pupil Referral Units, children educated at home, children whose whereabouts is unknown, 'Disappeared/Lost' children, children who have moved abroad, and attrition from the sample. These will all be looked at in more detail in the next section of this report.

Section 2: Tracking Procedures

Stage 1 Tracking

The purpose of Stage 1 in the tracking procedure is to establish if the child is at the school that we expect, given their previous pattern of attendance.

In the summer term each year, all schools with EPPE 3-11 children in attendance are sent a 'tracking proforma' (see Appendix 2) requesting detailed contact information. Schools are given the option of responding using a post-paid reply envelope or returning the proforma by fax. Included with this tracking proforma is a newsletter for Headteachers to keep them abreast of developments on the project. This is particularly important to ensure that we retain good working relationships with all our schools.

Although most schools are extremely efficient and helpful to the project there remains a considerable number who, because of changes of personnel, inadequate office practices or because they are in 'challenging' circumstances, provide us with information that is inadequate for tracking purposes. The most common reason for tracking proformas not being returned is due to the paperwork going 'astray' once it has been received by the schools. In these instances the tracking proforma is re-sent using the most appropriate and efficient method (by post, fax or e-mail). It is not uncommon to have to re-send tracking proformas to the same school several times. Re-sending is only done after several phone calls to the school to establish what has happened to our communications.

Once we have been provided with information by schools this is updated on our Tracking database. If children have transferred to a new school then the child's new school will be contacted and a description of the project sent. All new schools receive an information letter as well as a tracking proforma and our most recent newsletters.

From Stage 1 we can establish which children require further tracking, outlined below in Stage 2.

Stage 2 Tracking

The purpose of Stage 2 tracking is to put in place a series of mechanisms with schools to follow up on 'missing' children in order to establish their correct whereabouts.

Inadequate or incorrect information from Stage 1 Tracking

Searches at school level

Where inadequate, incomplete or incorrect information has been provided about a child's new school, the child's 'old' school is contacted by telephone / fax / e-mail in order that further information can be obtained about the child's new school. Once we have been provided with information by schools this is updated on our Tracking database. The child's new school is then contacted and introduced to the project, being sent a tracking proforma and a copy of our most recent newsletter for Headteachers. An example of inadequate information about a child's new school would be, a school that returns a tracking proforma stating that a child has left the school moving to a school outside of the Local Authority (LA). An example of incomplete information about a child's new school would be, a school returning a tracking proforma stating that a child has moved to 'St Mary's – not in this LA' as the receiving school. Edubase (DCSF on line school information service) could identify in excess of 150 "St Mary's" schools. Children are classified as 'whereabouts unknown' when a school provides no information about a child's new school. Occasionally schools provide incorrect information about children's new schools; this happened quite frequently when children moved to secondary school as a number of children did not attend the secondary school to which the primary / junior school normally fed.

Searches for incomplete family contact details
Where incomplete information involved a child's home address or contact details (e.g. a postcode) we use the Royal Mail website as this is an efficient source for this information and avoids having to trouble either schools or parents. However, where there was not enough information to use this method the school or child's parents were contacted to complete the information. Our experience is that sending out letters without a postcode can result in them being returned or severely delayed.

Stage 3 Tracking

In the majority of cases Stage 2 tracking will have established accurately the child's whereabouts; however, there are other stages for children whose whereabouts are uncertain. The purpose of Stage 3 is to use family contacts, for children still not tracked by Stage 2.

Searches at parent level
If information about the child's current school cannot be obtained from the child's previous school, researchers will contact the child's parents in order to try and establish where the child is now attending school. Whilst in pre-school this was comparatively easy as many parents, particularly mothers, were at home during the day. However, a common pattern now that young people are at secondary school is for parents to be in employment. This makes it difficult to make contact with parents during the day. Tracking by this route often requires researchers working unsocial hours.

Parental telephone tracking is seldom successful through one phone call. A common pattern is to telephone a home number at different times during the day. If contact is made straightaway with the parent then the information can be gained. However, it is seldom that the parent is instantly available. In most cases several messages are left for the parent and then follow-up calls are made. Approximately 80% of parents require contact several times to explain the nature of our calls and to gain the tracking information. In some cases, once contact is made we reinforce this by providing postal information to parents before re-contacting them to discuss the project.

An additional difficulty in parental telephone tracking is that we (and schools) have incorrect information on record. This is an increasingly common situation with many parents changing landlines to mobile phones and frequently changing mobile phone numbers. Where contact is not made with parents, we have to go back to the child's 'old' school to compare contact details.

We have usually found that if we can get parents on the phone they are usually extremely helpful and apologetic that they have 'forgotten' to let us know of their changed circumstances. In many instances they 'blamed' the schools for not letting us have their new contact information or did not realise the school did not have it or did not pass it on to us.

If we cannot make contact with parents by phone and the school has no new information we check the details of our 'second contact'. This is often a close relative, usually a grandparent, who has been nominated by the parent as a contact to gain up-to-date contact details for the parents/children. This information is requested when parents complete parent questionnaires and consent forms and is updated at regular intervals. Second contacts are invaluable to 'tracking' as they are either a direct source of tracking information or they are willing to act as a conduit, passing information to parents about our tracking enquiries. To date we have very few children who have not been successfully contacted by this route.

Where we have no current telephone contact number for the parent or a 'second contact', we have instigated a telephone 'search' via internet agencies. Although this is a last resort, this method has, rather surprisingly, yielded some success. Internet sites that are used by the project include BT.com and 192.com. Using these sites and location information it is possible to find out addresses or phone numbers for families. These sites however require a range of information to start the search.

Stage 4 Tracking

Stage 4 tracking uses Local Authority contacts to establish children's location.

Searches at Local Authority level
If parents and 'second contacts' are not contactable, then the 'old' or current Local Authority (LA) is contacted in order to establish the child's new school/situation. In some instances, surrounding LAs are contacted when it is known that the child has moved out of the immediate area. Where LAs are not able to establish the child's situation, a number of 'possible' schools are contacted.

Stage 5: Additional factors associated with Tracking

Contact with Social Services
During the period of this report, the number of EPPE 3-11 children who are involved with Social Services, has increased from 12 to 19 although the number of Social Services departments (SSD) we are in contact with has remained as eight; four EPPE 3-11 children involved with Social Services have left the project, one child disappeared / became 'lost' and we were unable to track them and three children left the project as their families no longer wanted to be involved. These children require particularly sensitive monitoring and gentle perseverance. These particular children, who often have unusual learning trajectories, can be of particular interest to a project to investigate issues of 'equity', especially for some of our most vulnerable children.

The project keeps in regular contact with the social workers of EPPSE children by writing to them regularly to confirm that they are still the child's social worker and check the child's circumstances. We enclose copies of newsletters sent to parents so that social workers are kept up to date with the project. In addition, social workers are contacted when children need assessments or move schools in order to confirm that the information we have is correct and up to date.

Pupil Referral Units
Occasionally we have had to contact and maintain communication with pupil referral units (PRUs) and more recently an 'Attendance and Behaviour Support' centre (for a child who has had a 'managed move' to avoid permanent exclusion from their secondary school).

Children educated at home
Where a child has left a school to be educated at home the 'old' school is contacted to establish the reasons behind the decision and then the child's family is contacted to establish who is educating the child at home (e.g. the parent, a private tutor etc). A few children have become educated at home since they moved to secondary due to bullying, inadequate facilities to meet their SEN or dispute over the child's secondary school. In contrast we have some children who have been educated at home during KS1 and/or KS2 and are continuing their education in this way during Key Stage 3 (KS3). We currently have 11 children who are being educated at home. It is important that we maintain contact with children educated at home as they need special consideration at assessment time points. In some cases assessments can be completed in the home and parents are able to provide useful information about their child's social/behavioural development that is comparable to that collected for school based children.

Children whose whereabouts is unknown
We currently have 34 children whose whereabouts is unknown. We are currently making every effort to 'track' these children using methods previously described.

Disappeared/Lost children and those who have moved abroad
Where a child's school and parent contact information has been unknown for some time and the child's 'old' school has been contacted several times, gleaning no new information about the whereabouts of the child, and LA liaison has not established the whereabouts of the child, decisions are made about whether to continue to include the child in the research. 119 children

have ‘disappeared’ (108 of those during KS1 or before). The children who have ‘disappeared’ and therefore left the project represent just under four per cent of the original sample.

Similarly for those children who have permanently moved abroad, decisions are made to no longer include the child in the research. Since the start of the project 91 children have moved abroad (39 of those during KS1 or before). The children who have left the project by moving abroad represent just under three per cent of the original sample and have varied backgrounds. In addition, two EPPE 3-11 children moved abroad (to Sweden and the USA) during KS1 and were then ‘tracked down’ when they returned to the UK during KS2. Four EPPE 3-11 children went travelling with their families during KS2 (in South Africa, Greece and Turkey) for between 12 and 24 months; the families of three of the four children had informed us of their plans before they left the UK. A small number of children (8) recruited to the project in the West Midlands have been on extended holidays (6 months - 18 months) to Pakistan with their families. In these cases we have only found out through contact with the children’s schools or families when trying to establish their whereabouts.

Attrition

The true attrition rate on the project is very low with only 127 children having left the project (78 of those before the children entered KS2) because they or their parents no longer wished to continue as part of the project. This represents four per cent of the original sample. In the main, the reason volunteered by parents has been because the family’s circumstances have changed and they want to ‘make a fresh start’. This can often follow divorce or separation (most commonly involving domestic violence) where parents want a complete ‘break’ from their old ‘lives’ following a move to a new geographical area. In a number of cases this has involved the death of a parent and the surviving parent not wanting to not dwell on circumstances that can cause additional grief to the child. As well as parents deciding to ‘opt out’, children also have the right to discontinue with the research. The right to withdraw consent is part of the code of ethical conduct adhered to by the research team. The very low attrition rate suggests that many parents and children see the project as research conducted ‘with’ them rather than ‘on’ them. The low attrition rate is also a reflection of the tracking procedures the project has in place and a lot of hard work to maintain good working relationships with children, families and schools.

Mailouts to schools and parents

Using the tracking database, we are able to produce address labels for mailouts to schools and children’s families, and personalise letters and questionnaires. We are also able to produce personalised tracking proformas for schools containing the most current information. The database allows us to track the progress of assessment returns and confirmation of attendance of children at schools, and helps to organise the mailing out of birthday cards and newsletters to EPPE 3-11 children/families.

Sending birthday cards and newsletters, as well as questionnaires not only helps us to chase up outstanding consent but also helps to keep contact information up-to-date; if a family has moved the envelope is usually returned to us because the project’s address is always stamped on the reverse of envelopes before they are posted out. Birthday cards also provide an opportunity, in addition to when newsletters are sent, to remind parents and children how important their contribution has been to the project.

Headteachers and school information

School contact details and status are regularly checked and updated, including the name of the current Headteacher and other key members of staff. A surprising number of schools have changed status over the period of this report due to closure and amalgamation.

Section 3: School status

The Current EPPE 3-11 sample

The current EPPE 3-11 sample spans four academic cohorts currently placed as follows:

	Date of birth	Entry to study (age 3+)	Year 7 (age 12)	Year 8 (age 13)	Year 9 (age 14)	Year 10 (age 15)	Year 11 (age 16)
Cohort 1	Sept 92 – Aug 93	Sept 95 – Aug 96	Sept 04 – Aug 05	Sept 05 – Aug 06	**Sept 06 – Aug 07**	**Sept 07 – Aug 08**	**Sept 08 – Aug 09**
Cohort 2	Sept 93 – Aug 94	Sept 96 – Aug 97	Sept 05 – Aug 06	**Sept 06 – Aug 07**	**Sept 07 – Aug 08**	**Sept 08 – Aug 09**	**Sept 09 – Aug 10**
Cohort 3	Sept 94 – Aug 95	Sept 97 – Aug 98	**Sept 06 – Aug 07**	**Sept 07 – Aug 08**	**Sept 08 – Aug 09**	**Sept 09 – Aug 10**	**Sept 10 – Aug 11**
Cohort 4	Sept 95 – Aug 96	Sept 98 – Aug 99	**Sept 07 – Aug 08**	**Sept 08 – Aug 09**	**Sept 09 – Aug 10**	Sept 10 – Aug 11	**Sept 11 – Aug 12**

Key

Cohort Year Groups

Academic Year 2006-2007

Academic Year 2007-2008

Academic Year 2008-2009

Academic Year 2009-2010

Key Stage (KS) Assessment time points

KS3 SATs Assessments (Year 9, age 14)

KS4 GCSEs (Year 11, age 16)

The 'schooling' status of the EPPE 3-11 sample is as follows:

The current EPPE 3-11 sample consists of 2835 children. Of these, 2801 children have been 'tracked', and are currently attending 739[1] schools. The current EPPE 3-11 'tracked' sample represents 88% of the original sample.

Table 2: The Current EPPE 3-11 sample

Cohort	Current Year	Original sample	Current 'tracked sample'	% of original sample	Number of schools
1	10	202	189	94	78
2	9	1267	1141	90	390
3	8	1588	1375	87	498
4	7	115	96	84	58
Total	-	**3172**	**2801**	**88**	**739**[2]

The current sample of EPPE 3-11 children are attending 57 Middle schools, 138 High Schools, 446 Secondary schools, and 87 schools cater for children of all ages. We also currently have 11 children educated at home.

[1] Please note that 218 of these schools have EPPE 3-11 children from more than one cohort in attendance, 11 children are currently receiving home tuition, and 34 children are currently whereabouts unknown.

[2] Please note that 218 of these schools have EPPSE pupils from more than one cohort in attendance, 11 EPPSE pupils are currently receiving home tuition, and 34 EPPSE pupils are currently whereabouts unknown.

Table 3: Types of schools the current EPPE 3-11 sample are attending[3]

Type of school	Number of schools	Number of Local Authorities (LAs)
Middle schools	57 (57)	17 (17)
High Schools	138 (129)	50 (42)
Secondary schools	446 (430)	111 (98)
Schools that cater for children of all ages.	87 (85)	39 (37)
Home educated children	11 (10)	7 (6)
Total	**739 (701[4])**	**126 (104)[5]**

Of the 739 schools, 608 are state schools and 116 are independent schools. In addition, the project has 32 children in special schools; five in special middle schools, 14 in special secondary schools and 13 children in specials schools that provide for children of all ages.

Table 4: Numbers of schools / pre-schools the sample attended (does not include all schools children ever attended in each period)

Type of school	Number of schools
Pre-school period (age 3-5)	141
KS1 (age 5-7)	862
KS2 (age 8-11)	1128
KS3 (age 11+)	**739**

Tracking is an on-going process which does not take place just at the key points of transfer for children i.e. when changing from pre-school into school, or KS1 to KS2. Our experience during the pre-school and primary years has shown that our sample is a very mobile one. The movement of children from 141 pre-school settings in six Local Authorities (LAs) to over 800 primary schools in over 100 LAs illustrates the extent to which our sample has become dispersed. It was thought that once children moved to secondary school, the number of schools EPPE 3-11 children attend would reduce substantially. Now the children have moved to secondary schools (739 schools) the sample spans 108 out of the 150 English Local Authorities (LAs).

Tracking children outside English Local Authorities

In addition to having EPPE 3-11 children attending the 701 schools located in English LAs, EPPE 3-11 also has 13 children currently attending 13 schools in 10 LAs in Scotland, two children currently attending two schools in two LAs in Northern Ireland, one child currently attending a school in Ireland and eight children currently attending eight schools in six LAs in Wales. We have also had a small number of children who are currently educated abroad that have been tracked; one moved to Germany towards the end of KS1, one moved to Germany since transferring to secondary school, and another has moved to Dubai since attending middle school. We also had one child who was educated during KS1 at a British Forces School in Germany, however, when the child left the school after a year we were unable to track the child and therefore the team decided not to continue to include the child in the research.

[3] Figures in brackets are for England only.
[4] Home educated children have not been included in this figure.
[5] These figures give the total number of LAs and are not the additive total of the categories above as they are not mutually exclusive.

Pupil attainment data and school movements

Now that all of the EPPE 3-11 children have left primary schools we are continuing to follow them in their middle and secondary schools. In order to maintain contact with the Cohort 4 children, who had moved from primary into secondary (KS2 to KS3) schools in the summer of 2007, we wrote to all 'new' secondary schools in order to introduce them to the project and make them aware of the children's involvement. Establishing positive relationships with schools is essential for maintaining the sample. For 10 years EPPE has had extremely good relationships with over 800 primary schools. We are now building these relationships with colleagues in the secondary sector. To this end we are regularly sending Headteachers and Form Tutors updates on the project.

In contrast to the majority of our children, who had their main transfer point at the end of KS2 when they transferred from primary (or junior schools) to secondary education, some children in Cohort 3 transferred from middle schools to high schools in the summer of 2007 and we have been in contact with these schools to induct them in to the project and establish good relationships.

We are continuing to communicate with the 575 schools with secondary age EPPSE child, in Cohorts 1 and 3, in order to confirm their attendance. We make a particular effort to contact 'new' schools as soon as possible, although often we find out that children have transferred to new schools a number of months after the move occurred. We always prefer to ensure that new schools have some written information about the project before 'cold' telephone calls.

Since our most recent mail out to new secondary schools (Cohort 4, Year 7 children joined in September 2007) we had only heard back from 14 schools. We have followed this up with phone calls to schools to confirm that the information was received and that the children are in attendance. However, this has been very time consuming due to the administrative arrangements in secondary schools, which differ markedly from those in primary schools. Having larger school administrative teams often makes it difficult to find out whether our information was received and to confirm that children are attending the school. We are increasingly re-sending information to schools electronically or by fax. This mixed strategy approach seems to be a more effective and efficient way to liaise with secondary schools.

All returned assessments are logged on the tracking database, before being entered on to the relevant assessment databases. This allows the tracking database to be used efficiently to follow up unreturned assessment data. Our excellent response rates (see below) for a 10 year longitudinal study reflect the excellent relationships we have established over a number of years with our primary schools and the competence of our Tracking staff.

Section 4: Response rates to instruments

Tracking and good follow-up procedures have enabled the research team to consistently register excellent response rates on a range of research instruments. The final outcome data for the EPPE 3-11 study is data collected at the end of Key Stage 2 (KS2; Year 6 in primary schools). The information below gives a summary of the response rates in Year 6.

Year 6 Child Profiles

The Child Profile is a measure of children's social/behavioural development as measured by the Year 6 class teacher, or someone in the primary school who knows the child well. The response rate over the whole sample is as follows:

Cohort 1 – 124 / 185 = 67%
Cohort 2 – 1116 / 1180 = 95%
Cohort 3 – 1344 / 1416 = 95%
Cohort 4 – 98 / 98 = 100%
Total - 2682 / 2879 = 93%

We are particularly pleased with the response for Cohort 4 which, although the smallest cohort, demonstrates (see table below) the importance of being able to track the sample and put in place efficient follow-up procedures.

Table 5: Cohort 4 Year 6 - Child profiles

Cohort 4	No. of schools	No. of schools Returned (22/06/07)	%	No. of schools Returned (28/09/07)	%	No. of children	No. of children Returned (22/06/07)	%	No. of children Returned (28/09/07)	%
East Anglia	3	3	100	3	100	3	3	100	3	100
Shire County	0	n/a	n/a	n/a	n/a	0	n/a	n/a	n/a	n/a
Inner London	41	27	66	41	100	55	34	62	55	100
North East	25	18	72	25	100	40	32	80	40	100
West Midlands	0	n/a	n/a	n/a	n/a	0	n/a	n/a	n/a	n/a
Totals	69	48	**70**	69	**100**	98	69	**70**	98	**100**

The final 100% response rate was achieved through re-sending information out to schools with robust follow-up procedures.

Year 6 Parent Questionnaires

Collecting data from parents can be problematic and increasingly studies (particularly longitudinal studies) are finding maintaining high response rates challenging. It would not be unusual for a typical postal questionnaire, without any follow-up to have less than a 20 per cent return rate. The following figures show the response rate, across four cohorts for our end of Year 6 parental questionnaire:

Cohort 1 –168 / 185 = 91%
Cohort 2 – 839 / 1180 = 71%
Cohort 3 – 1095/ 1416 = 77%
Cohort 4 – 70 / 98 = 71%
Total - 2172 / 2879 = 75%

Parent questionnaires are completed during the last year of a child's primary schooling and are designed to monitor changes in households since the last family questionnaire (administered

during KS1). The table below demonstrates how responses rates can be boosted with accurate tracking and concerted follow-ups.

Table 6: Cohort 4 Year 6 - Parent Questionnaire

Cohort 4	Sent out	Returned (22/06/07)	%	Returned (06/12/07)	%
East Anglia	3	3	100	3	100
Shire County	0	n/a	n/a	n/a	n/a
Inner London	55	37	36	40	73
North East	40	26	43	27	68
West Midlands	0	n/a	n/a	n/a	n/a
Total	**98**	**66**	**41**	**70**	**71**

Good tracking and follow-up has enabled us to almost double the response rate.

Section 5: Tracking and Mobility

What have we learnt about tracking the EPPE 3-11 sample to reduce attrition during a longitudinal study?

In conclusion we summarise what have we learned about tracking a longitudinal sample.

- Resources for tracking a longitudinal sample need to build into a research grant from the outset;
- Multiple sources are needed for tracking a longitudinal sample (i.e. families, family friends, schools, other agencies);
- Regular contact needs to be established with all sources in order to keep abreast of changes and therefore successfully track a longitudinal sample;
- Thorough tracking processes need to be established and followed in order to retain a longitudinal sample;
- Successful tracking of a longitudinal sample enables communication with the research participants and other agencies assisting the study, helping them to remain committed to and feel a valued part of the research.

Accurate tracking has enabled this 10-year longitudinal study to ascertain the whereabouts of the sample, maintain good relationships with families and schools, and promote excellent response rates. In addition, it has enabled us to expand our work in looking at the effects of mobility on children's cognitive attainment and progress and social/behavioural development.

The second part of this report explores 'mobility' across the sample at different time points.

Part 2: The Mobility of the EPPE 3-11 Sample

This part of the report uses measures of children's mobility for the EPPE 3-11 sample, along with information about children's background (child, family and Home Learning Environment [HLE] characteristics) and attainment data to examine the possible influence of mobility on EPPE 3-11 children's cognitive progress and social/behavioural development over both the pre-school and primary school periods.

Section 6: Mobility

Background

Mobility, in the context of the present research, is defined as a within-phase change of pre-school or primary school; it is thus distinguished from changes due to school closure, amalgamation, or transfer across phases of schooling. The research objectives are threefold:

1. To identify any likely predictors of mobility itself, that is, whether mobile individuals share any defining characteristics;
2. To investigate whether mobility exerts any independent influence over EPPE 3-11 children's cognitive and social/behavioural outcomes net of other potential influences (child, family and HLE); and
3. To explore whether there are any measurable consequences of mobility in terms of whether a child is likely to move to a more academically effective school compared to their earlier school.

Prior research has only dealt with mobility during school age, and has indicated that mobility, specifically moving school, is associated with lower levels of academic attainment. Machin, Telhaj and Wilson (2006) found that children aged 5 to 16 who change schools are more likely to have a low previous academic attainment record than children who do not change. However, Machin et al., (2006) also found that: "pupils who move school and home simultaneously are typically more socially disadvantaged than otherwise" (p. Executive Summary). Furthermore, Strand and Demie (2006) have found that although 7 to 11 year old pupil mobility is associated with poorer attainment, when other background factors (e.g. disadvantage) are taken into account this association is reduced, and it completely disappears when looking at progress, i.e. controlling for prior attainment. These findings suggest that social disadvantage rather than mobility account for lower academic attainment, with mobility co-varying with disadvantage rather than exerting an independent influence on academic attainment. This should be qualified by the findings of Strand and Demie (2007) who found that mobility did have a significant negative association with academic performance by age 16 (GCSEs and other measures).

Previous research suggests that mobility itself is unlikely to influence academic attainment for the age range covered in EPPE 3-11, although pre-school mobility has not received any attention so far. The research reported in this paper covers ages 3-11 and concentrates on mobility measured over the pre-school and primary school period up to the end of Key Stage 2 (KS2; Year 6; age 11).

Mobility Measures

The pre-schools and primary schools the EPPE 3-11 children attended were recorded and any subsequent change of school recorded. In the case of primary school this was recorded at the start of Reception, and the start of Years 1 to 6. Additionally any change of primary school during the school year up to the end of Year 6 was also recorded.

Section 7: Method

Respondents and test materials

The mobility research utilises the Effective Pre-school and Primary Education 3-11 (EPPE 3-11) project database. The initial cognitive and social/behavioural outcomes are from assessments completed on the child's entry to the study (see below). The children's academic performance was then tracked from age 5 (entry to Reception) to age 11 (the end of Key Stage 2; KS2).

All respondents were drawn from the original EPPE sample. Throughout the analysis, except where indicated, the children who did not attend pre-school ('home' children) were excluded in order to maintain the homogeneity and integrity of the sample and to estimate the influence of different aspects of mobility on outcomes.

Measures of Cognitive Outcomes

Pre-school and Baseline Cognitive Outcome

Four assessments were taken from the British Ability Scales, 2nd Ed (Elliot, Smith, & McCulloch, 1996) Block Building; Verbal Comprehension; Picture Similarities; and Naming Vocabulary. For further details see Melhuish, Sylva, Sammons, Siraj-Blatchford, and Taggart (2001).

Start of Primary school Reception Cognitive Outcomes

Several of the assessments were taken from the British Ability Scales, 2nd Ed (Elliot, Smith, & McCulloch, 1996), specifically: Early number concepts; Verbal Comprehension; and Naming Vocabulary. A composite score was produced for Total Verbal Ability (sum of Verbal Comprehension and Naming Vocabulary). Additional assessments included phonological awareness (Bryant & Bradley, 1985) and letter recognition tasks (Clay, 1993). A Pre-reading composite score was derived from the sum of these two measures. For further details see Melhuish, et al. (2001).

The Reception cognitive outcomes utilised in the mobility research were:

- Early number concepts score, with a sample size of 2631: 1374 boys, and 1257 girls;
- Total Verbal score, with a sample size of 2645: 1385 boys, and 1260 girls;
- Pre-reading score with a sample size of 2629: 1372 boys, and 1257 girls.

KS1 Cognitive Outcomes

The cognitive outcomes used to represent performance over KS1 were taken in Year 2 at the school attended by the EPPE 3-11 child, and are as follows:

Year 2 Mathematics: National Assessment in Mathematics. Total sample: 2232; with 1161 boys, and 1062 girls.

Year 2 Reading: National Assessment in Reading. Total sample: 2266; with 1181 boys, and 1085 girls.

In the case of both Mathematics and Reading scores the raw scores were normalised for age the assessments were taken and standardised to produce a mean score of 100 and standard deviation of 15 across the whole sample. For further details see Sammons, Sylva, Melhuish, Siraj-Blatchford, Taggart, and Elliot (2002).

KS2 Cognitive Outcomes

The cognitive outcomes used to represent performance over KS2 were taken in Year 6 at the school attended by the EPPE 3-11 child, and are as follows:

Year 6 Mathematics: National Assessment in Mathematics. Total sample: 2701; with 1375 boys, and 1326 girls.

Year 6 Reading: National Assessment in Reading. Total sample: 2690; with 1360 boys, and 1330 girls.

Measure of social/behavioural Outcomes

Pre-school & Baseline Social/behavioural Outcomes
When the child was 3-4 years of age at the start of the study, a pre-school worker familiar with the child rated the child using the 30 items from the Adaptive Social Behavioural Inventory (ASBI) (Hogan, Scott & Bauer, 1992), each on a three point scale (not true, somewhat true, and certainly true). The items were then subjected to Principal Components Analysis (Varimax rotation) producing a five component solution: 'Co-operation & Conformity'; 'Peer sociability'; 'Confidence'; 'Anti-social behaviour'; 'Worried/upset behaviour'. For further details see Melhuish et al., (2001).

Reception Social/behavioural Outcomes
Shortly after the child started school a teacher familiar with the child rated the child on the Child Social Behaviour Questionnaire (CSBQ), which itself is an extension of the ASBI. Application of Principal Components Analysis produced a four component solution. 'Independence & Concentration', 'Co-operation and Conformity' and 'Peer sociability', all had a sample size of 2565: 1338 boys, and 1227 girls. 'Anti-social/worried' had a sample size of 2564: 1337 boys, and 1227 girls. See Sammons et al., (2003).

KS1 Social/behavioural Outcomes
At Year 2 class teachers completed an extended version of the Strengths and Difficulties Questionnaire (Goodman, 1997) for each EPPE 3-11 child. Each item was measured on a three point scale (not true, somewhat true, and certainly true). A Principal Components Analysis produced a four component solution: 'Self-regulation'; 'Pro-social' behaviour; 'Anti-social' behaviour; and 'Anxious' behaviour. Each of these constructs had a sample size of 2238, with 1160 boys, and 1078 girls. For further details see Sammons, Sylva, Melhuish, Siraj-Blatchford, Taggart, Elliot, and Marsh (2004).

KS2 Social/behavioural Outcomes
An extended version of the Strengths and Difficulties Questionnaire (Goodman, 1997) was used to measure different features of children's social/behavioural development in both Year 5 and Year 6. Each item was measured on a three point scale (not true, somewhat true, and certainly true). This social/behavioural child profile was completed by a class teacher who knew the child well. A Principal Components Analysis was used to identify the main underlying dimensions of social behaviour in Year 5: 'Self-regulation', 'Pro-social' behaviour, 'Hyperactivity' and 'Anti-social' behaviour (see Sammons, Sylva, Melhuish, Siraj-Blatchford, Taggart and Barreau, 2007a). Similar analyses were repeated on Year 6 data, which confirmed the four social/behavioural dimensions. Higher scores indicate better behaviour for the factors 'Self-regulation' and 'Pro-social' behaviour. By contrast, lower scores indicate better behaviour (in terms of lower incidence reported by teacher ratings) for 'Hyperactivity' and 'Anti-social' behaviour. The sample size for each social/behavioural measure for Year 6 is 2661 for 'Self-regulation' and 'Anti-social' behaviour (1377 boys and 1284 girls), 2663 for 'Pro-social' behaviour (1379 boys and 1284 girls) and 2664 for "Hyperactivity" (1379 boys and 1285 girls).

Demographics

Child and family background characteristics were recorded at age 3-4 years from information collected during a structured interview with the child's parents (98% response), along with detailed measures of the Home Learning Environment (HLE) (See Glossary). The items measured in the interview included parental employment status; parental qualifications; child's ethnicity; parental marital status; the number of siblings the child had.

Mobility Measures
The pre-schools EPPE 3-11 children attended when they joined the study were recorded and any subsequent changes of pre-schools were also recorded until the children joined reception classes when starting school. In the case of primary school this was recorded at the start of Reception, and the start of Years 1-6. Additionally, any change of primary school during the school year up to the end of Year 6 was also recorded. This allows a distinction to be made between moves made during the school year and those made between school years.

School Academic Effectiveness Ratings
Data used to calculate the academic effectiveness of the schools were taken from National Assessment records for KS1 in English, Mathematics and Science for the period 2002-2004 as well as PLASC records for the same period. These records contain pupil level test scores along with background information, such as ethnicity, eligibility for free school meals (FSM), special educational needs (SEN), and child's postcode.

The school academic effectiveness ratings are derived from multilevel models of pupil attainment where school is the grouping factor. The analyses were undertaken for all state primary schools in England for three successive years (2002-2004). When pupils' prior attainment and various background factors, such as gender, ethnicity, area deprivation etc. have been controlled for, or taken into account, there is a residual effect of the school attended, which constitutes a measure of school effectiveness. That is, the academic effectiveness rating is the influence of the school on a child's progress independent of other contributing factors, (Melhuish, Romaniuk, Sammons, Sylva, Siraj-Blatchford & Taggart, 2006).

In the present research the final effectiveness scores are the residuals averaged over English, Mathematics and Science, averaged over the period 2002-2004. This provides a single, mean centred value for each school.

Neighbourhood Measures
Allied to measures of School Effectiveness Ratings are measures of EPPE 3-11 children's neighbourhood in terms of the Index of Multiple Deprivation (IMD) – for further details see The English Indices of Deprivation 2004: Summary (revised), (2007).

The IMD is a nationwide index combining weighted measures or levels of: crime; barriers to housing; living environment; education & skills training; health deprivation & disability; employment and income. The greater the IMD score the greater the level of deprivation. The index is divided into Local Authority (LA) and Super Output Areas (SOA), where SAOs are defined as areas smaller than wards, frequently nested in wards, and of broadly consistent population size. For the purposes of analysis the 2004 IMD scores were assigned to each child on the basis of their pre-school home address (using postcode) being used to identify the appropriate SOA.

Analysis Strategy
Initially descriptive statistics are produced detailing the prevalence rates of mobility for certain key variables. Subsequently, logistic regression is applied to the data where mobility is treated as the outcome variable in order to identify whether mobility is predicted by any socio-demographic variables.

Next multilevel models are applied to the data to explore the influence of mobility on the outcomes detailed above. The models included all items previously identified as relevant to the given outcome, and prior cognitive attainment or Social/behavioural development measures as first level predictors; at the second level the EPPE 3-11 children are grouped by initial pre-school centre (N = 141), and at Year 6 by school (N = 825).

Finally, analyses explore whether mobility results in EPPE 3-11 children attending schools that differ in terms of academic effectiveness scores.

Section 8: Results

Mobility Descriptive Statistics

The following section examines the EPPE 3-11 sample for variation in mobility according to key geographic, demographic and pre-school characteristics over the pre-school, KS1 and KS2 periods.

The EPPE 3-11 sample itself was composed of 2857 children recruited in six Local authorities (LAs) in England, from 141 pre-school centres. By Reception, 103 (3.6% of the initial sample) children had left the study (moving abroad, moving to pre-schools / schools were they could no longer be 'tracked' or voluntarily disengaging from the study). Most of these children were from the more urban areas of Inner London and the West Midlands. Further details are presented in Table 7.

Table 7: Children who left the study before reception

Area	N	Left by reception	% of N
East Anglia	559	15	2.7
Shire County	594	14	2.4
Inner London	656	30	4.6
North East	503	4	0.8
West Midlands	545	40	7.3
Total	2857	103	3.6

To examine the impact of no pre-school provision, an additional sample of 315[6] 'home' children who had no pre-school experience was recruited from the reception classes which children from the pre-school sample attended. As with the pre-school sample, the numbers of children who had received no pre-school provision varies in the five regional areas reflecting differences in the amount of provision and access to centres.

The additional sample of 'home' children brought the sample size to 3172. However, throughout the present report the 'home children' are excluded from analyses in order to render the KS1 and KS2 mobility sample and subsequent analysis comparable with the pre-school sample.

In terms of mobility, over a third (35.3%) of the EPPE 3-11 sample changed pre-school at least once; and of these mobile children a quarter changed pre-schools on two or more occasions. Initially the distribution of mobility during the pre-school period will be examined in terms of region of recruitment to the study, following this mobility during KS1 and KS2 will be examined.

a) Mobility by Area

Table 8 shows the proportion of mobile children by the area from which they were recruited for the pre-school period, KS1 and KS2.

Inner London and the North East had the largest proportions of children moving pre-schools (45.7% and 44.9% respectively), while children in the areas East Anglia and the West Midlands showed less movement with nearly three quarters (73.2%) of children attending a single pre-school between the ages of 3 and 5. The proportionate lack of mobility in East Anglia may be in some part due to it being more rural than any of the other areas.

Table 8 indicates that approximately half the sample, in both Inner London and the North East, were mobile during the pre-school period (46% and 45% respectively). The lowest frequencies of mobility we observed in East Anglia and West Midlands (27% for both).

[6] It was hoped to have a larger sample of 'home' children but they were difficult to find due to increase in pre-school use.

Table 8: Mobility within area[7]

Area of the country child started the study in	Pre-school				KS1				KS2			
	Non-mobile		Mobile		Non-mobile		Mobile		Non-mobile		Mobile	
	n	%	n	%	n	%	n	%	n	%	n	%
East Anglia	409	73.2	150	26.8	461	84.7	83	15.3	431	81.3	99	18.7
Shire County	407	68.5	187	31.5	498	85.9	82	14.1	449	79.6	115	20.4
Inner London	356	54.3	300	45.7	504	80.5	122	19.5	426	72.4	162	27.6
North East	277	55.1	226	44.9	426	85.4	73	14.6	370	75.7	119	24.3
West Midlands	399	73.2	146	26.8	399	79.2	105	20.8	378	78.9	101	21.1
Total	1848	64.7	1009	35.3	2288	83.1	465	16.9	2054	77.5	596	22.5

During KS1 mobility was far less common: the greatest frequency was in the West Midlands where it only amounted to a fifth of the sample, and as low as 14% of the sample in the Shire county.

During KS2 the prevalence of mobility increased compared to KS1. The most striking feature is that over a quarter of the children in the sample in the Inner London area were mobile (27.6%), and these children made up over a quarter of all those children who were mobile during KS2 (27.2%); previously this area had shown one of the highest rates of mobility during the pre-school and KS1 period. The North East area also showed a high rate of mobility during KS2 (24.3%), having previously had one of the highest rates of mobility during the pre-school period (44.9%) and then one of the lowest during KS1 (14.6). The lower rates of mobility during KS2 were found in the East Anglia area (18.7%) and the Shire County area (20.4%).

b) Mobility and Pre-school Type

Table 9 shows mobility within the types of pre-school the EPPE 3-11 children attended when they started in the project.

Table 9: Mobility within Pre-school Type

Type of Pre-school child attended when they started in the project	Pre-school				KS1				KS2			
	Non-mobile		Mobile		Non-mobile		Mobile		Non-mobile		Mobile	
	n	%	n	%	n	%	n	%	n	%	n	%
Nursery classes	491	83.5	97	16.5	492	84.1	93	15.9	453	80.3	111	19.7
Playgroups	232	38.1	377	61.9	488	84.4	90	15.6	445	79.9	112	20.1
Private day nurseries	258	50.0	258	50.0	430	85.8	71	14.2	378	77.3	111	22.7
Local Authority day nurseries	242	55.9	191	44.1	321	77.5	93	22.5	274	70.3	116	29.7
Nursery schools	472	90.9	47	9.1	422	83.7	82	16.3	384	78.7	104	21.3
Integrated centres	153	79.7	39	20.3	135	78.9	36	21.1	120	74.1	42	25.9
Total	1848	64.7	1009	35.3	2288	83.1	465	16.9	2054	77.5	596	22.5

[7] By the time children started school at the beginning of KS1, some children had already moved to a different area than the one they were in when recruited to the study, particularly children from Inner London (39.7%); East Anglia (1.6%), Shire County (5.6%), North East (10.0%) and West Midlands (7.0%).

Table 9 indicates that over half (61.9%) of children who attended Playgroups, half of the children who attended Private day nurseries and nearly half (44.1%) of children who attended Local Authority day nurseries moved pre-school: that is, changed the pre-school centre they attended. However, the majority of children attending Nursery classes, Nursery schools and Integrated centres did not move.

It is also possible to conclude from Table 9 that the majority of the children who moved pre-schools attended Playgroups, Private day nurseries or Local Authority day nurseries when they joined the study (81.9%). Children who attended pre-school for a longer length of time (two years or more) were more likely to move pre-schools. Furthermore, children who started pre-school at a young age (attending for two years or more) were more likely to attend Private day nurseries, Playgroups and Local Authority day nurseries (which cater for children of younger ages). Children attending Playgroup tend to start at an earlier age therefore they have a greater time period in which to move.

Private day nurseries: The majority of children (over 70%) who were attending Private day nurseries when they joined the study started pre-school at a young age (attending for more than two years; 32% attending for more than 3 years). These children also tended be more advantaged; their parents were likely to have higher level qualifications (degree or higher degree) and to be working and be in the higher SES groups (Professional non-manual and Other professional non-manual). These children were also unlikely to score highly on the multiple disadvantage index (i.e. be more advantaged).

Playgroups and Local Authority day nurseries: The majority of children (60%) who were attending Playgroups and Local Authority day nurseries when they joined the study also started pre-school at a young age (60% of those at Playgroups attending for more than two years; 64% of those at Local Authority day nurseries attending for more than two years, 28% attending for more than 3 years). Unlike children attending Private day nurseries, children attending Playgroups and Local Authority day nurseries were from more wide ranging backgrounds, although the majority of these children's parents (60% or more) were in the three highest SES groups (Professional non-manual, Other professional non-manual and Skilled non-manual).

At KS1 it was those children who were recruited from Local Authority day nurseries (22.5%) and Integrated centres (21.1%) who were the most mobile children, while those children who had attended private day nurseries (14.2%) were the least likely to move schools**.**

By KS2 the lowest rates of mobility were associated with children from Nursery classes (19.7%) and Playgroups (20.1%). Children who had attended Integrated centres and Local Authority day nurseries had the highest mobility rates during KS2 (25.9% & 29.7% respectively).

In view of previous findings concerning the link between social disadvantage and mobility (Strand 2002), and the associations described in the present section, the following section examines mobility in terms of those socio-demographic factors relevant to disadvantage beginning with eligibility for free school meals (FSM) as a measure of social disadvantage.

c) Mobility and Family Background

Table 10 indicates eligibility for FSM at Year 2 by pre-school and KS1 mobility, and eligibility for FSM at Year 6 for KS2. FSM is used here as an indicator of family poverty or deprivation. The mean rate of mobility can be read as the percentage of mobile children in the relevant group at a particular time.

Table 10 indicates that mobile children constituted thirty-three per cent of the whole sample during pre-school, during KS1 this had dropped to fourteen percent, but again stood at twenty-three percent during KS2.

Table 10: Mobility and FSM

Time Point	FSM Status	Total		Non-mobile		Mobile		Mean Rate of Mobility
		n	%	n	%	n	%	
Pre-school	Non-FSM	1584	80	1024	52	560	28	0.35
	FSM	376	20	287	15	89	5	0.24
	Total	1960	-	1311	67	649	33	-
KS1	Non-FSM	1584	80	1387	70	197	10	0.12
	FSM	376	20	303	16	73	4	0.19
	Total	1960	-	1690	86	270	14	-
KS2	Non-FSM	2234	85	1748	66	486	19	0.22
	FSM	411	15	302	11	109	4	0.27
	Total	2645	-	2050	77	595	23	-

In terms of the Non-FSM group thirty-five (n=560) moved during the pre-school period; for the same group only twelve percent (n=197) moved primary school during KS1, and twenty-two moved during KS2. In the case of the FSM group the figure stood at twenty-four for the pre-school period, nineteen during KS1, and twenty-seven during KS2.

In terms of those mobile the proportion from the FSM group was fourteen percent (n=89) during the pre-school period (the remaining 86% being non-FSM), twenty-seven percent (n=73) during KS1 (the remaining 73% being non-FSM), and eighteen percent (109) during KS2 (the remaining 82% being non-FSM).

The association between social advantage/disadvantage and mobility becomes clearer if additional socio-economic measures are considered in terms of mobility at the two different stages. The EPPE 3-11 project generated a measure of multiple disadvantage, on a scale of 0 to 7. This combined a series of items from the child's personal and family background, such as having English as an additional language (EAL), and family socio-economic status (SES), and the home educational environment (HLE), although not FSM (See Appendix A for further details).

The pattern evident in Figure 1.1 shows the more advantaged children had higher rates of pre-school mobility and lower rates in KS1. There was little discernable difference by advantage in terms of KS2 mobility, except in the cases of those with the highest levels of disadvantage, who also had the highest rates of mobility.

Appendix B contains figures and tables showing various measures that are combined to produce Total Multiple Disadvantage index. These, in essence, repeat the pattern seen in Figure 1.1: in each case the rate of pre-school mobility increases with (social) advantage, and KS1 mobility increases with disadvantage, while KS2 mobility is not particularly sensitive to disadvantage.

Figure 1.1: Average Rate of Mobility by Multiple Disadvantage

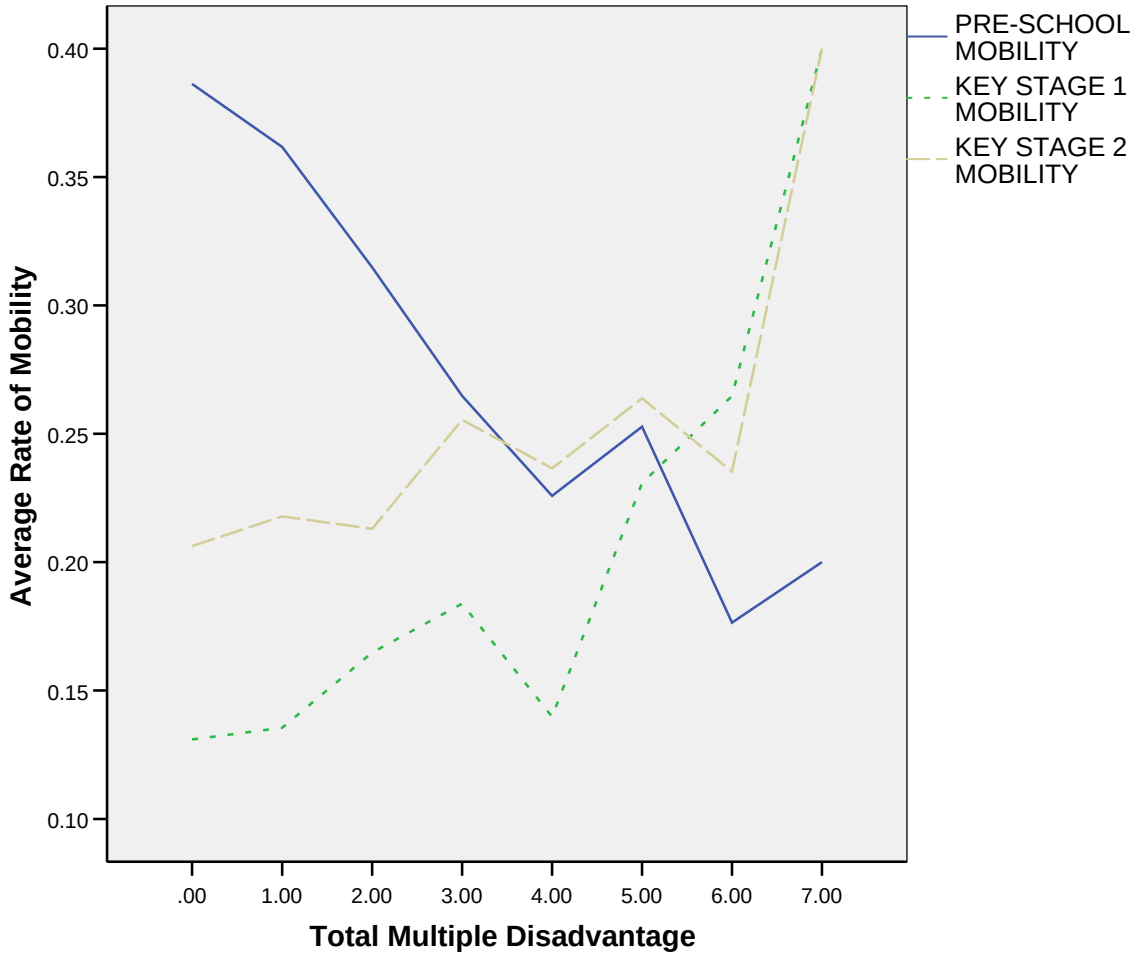
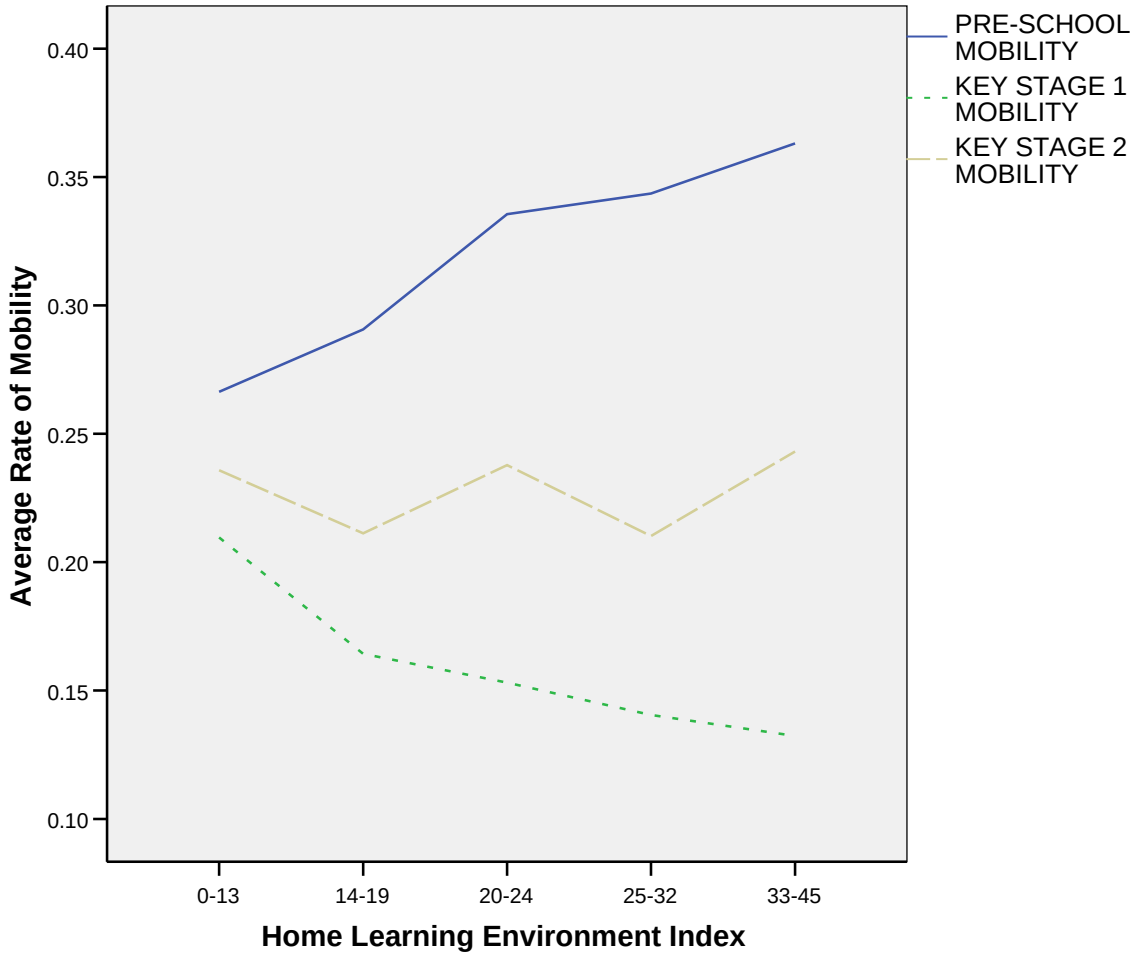


Figure 1.2 shows the association between the Early year's Home Learning Environment (HLE) index[8] and mobility. Although this index is a constituent part of the Total Multiple Disadvantage considered above, it is useful to examine it in isolation as, it captures a specifically educational feature of the child's background, and one shown to have predictive power in terms of later attainment (Melhuish et al., 2001; Sammons *et al*., 2002; 2003; Melhuish, Sylva, Sammons, Siraj-Blatchford, Taggart & Phan, 2008).

Figure 1.2 indicates there is clear evidence of the association between mobility and education extending into the home in terms of the level of educationally orientated activity between parents and children: the higher the level, the more likely pre-school mobility, the lower the level the more likely KS1 mobility, although there is no clear association between HLE and KS2 mobility.

8 A number of measures collected at the entry to study from the parent interviews provided an indication of aspects of the Home Learning Environment in the early years. These are based on the frequency of engagement in specific activities involving the child such as, teaching the alphabet, reading to the child, listening to the child read, taking the child to the library etc. (as reported by the parents).

Figure 1.2: Average Rate of Mobility by Level of Home Learning Environment (HLE)



Summary: Mobility Descriptive Statistics
Pre-school mobility is both more prevalent than KS1 mobility and clearly associated with social advantage, while KS1 mobility is, conversely, associated with social disadvantage: this apparent relationship is examined in more depth in the next section. There is less evidence of social advantage being associated with KS2 mobility.

In terms of pre-school centres the majority of the children who moved pre-schools attended playgroups, private day nurseries and Local Authority day nurseries when they joined the study. Further, the vast majority (80.9%) of children who moved pre-schools attended these three types of pre-school. Additionally, children who attended pre-school for a longer length of time (two years or more) were more likely to move pre-schools.

Most mobile children (60%+) moved to Nursery classes either for their first (or second) change of pre-school. Nursery classes are based at primary schools, so the fact that the majority of mobile children during pre-school moved to a Nursery class, could be interpreted as parents strategically moving their children to a Nursery class within the primary school they wish their child to attend in the future; when they officially start school in reception class. It is also possible that parents chose to move from fee paying to free provision at age 3 plus. Further evidence for this claim concerning the objective of pre-school mobility will be considered in Results section 7.

Composition of the Mobility Groups

This section builds on the findings of the previous section, where clear associations were identified between mobility at different time points and general levels of social advantage. Here we investigate whether pre-school and / or KS1 and KS2 mobility can be predicted in terms of particular family background characteristics.

As in the preceding section the analysis divides the sample into the non-mobility and mobility group (having moved school at least once) and treats this grouping as the outcome – the analysis then takes the form of attempting to establish whether there are any factors that make membership of the mobility group more or less likely. Each factor identified in the text is significant at $p < .05$.

a) Composition of Mobility Groups: Pre-school

Logistic regression techniques were applied to the data in order to predict mobility group membership, first for pre-school, then for Key Stages 1 and 2. Table 11 shows the eventual significant predictors for mobility during pre-school.

Table 11: Significant Predictors for at least one Pre-school move (N =2766)

Significant Predictors	Logistic r	S.E.	Odds Ratio
Eligibility for FSM	-.34	.14	0.71*
Mother's Highest Qualification	.19	.03	1.21***

* $p < .05$; ** $p < .01$; *** $p < .001$.

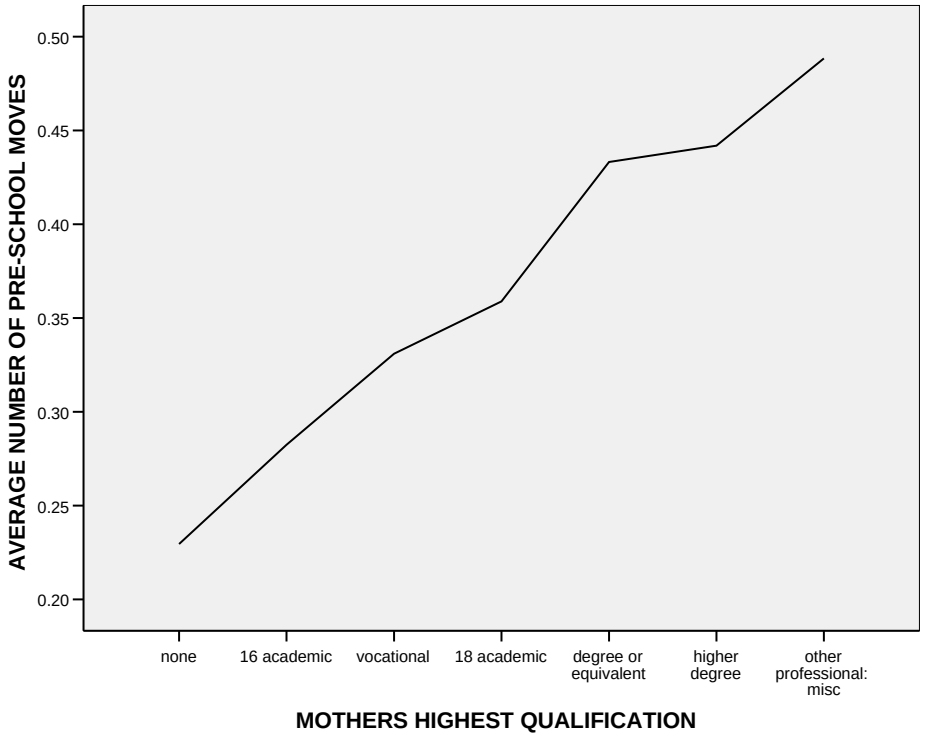
The results in Table 11 indicate that the likelihood of moving during the pre-school period decreases if the family is eligible for FSM, as the odds ratio figure is less than 1 (0.71), and, conversely, increases as the mother's academic / professional qualifications increase, as the odds ratio is greater than one (1.21). It should be noted that the FSM measure used here is from Year 2 but applied to Reception – as Year 2 offers a point where the attribution or allocation of free school meal status has stabilised, and can be used with consistency with KS1 analysis.

Table 10 shows the average number of pre-school moves by FSM. Table 12 and Figure 2.1 show the average number of pre-school moves by mother's highest qualification.

Table 12: Average number of Pre-school moves by Mother's Highest Qualification

Mothers Highest Qualification	N	Average Rate of Mobility	s.d.
None	501	0.23	.42
16 Academic	1048	0.28	.45
Vocational	423	0.33	.47
18 Academic	248	0.35	.48
Degree	374	0.44	.50
Higher Degree	129	0.44	.50
Professional	43	0.49	.51

Figure 2.1 Average rate of Pre-school mobility by Mother's Highest Qualification



b) Composition of Mobility Groups: KS1

Similar analyses were conducted on the KS1 mobility group in order to identify any socio-demographic factors relating to its composition. The results are presented in Table 13.

Table 13: Significant Predictors for KS1 mobility (N =2753).

Significant Predictors	Logistic r	S.E.	Odds Ratio
Absent Father	.33	.12	1.39**
Eligibility for FSM	.43	.16	1.53**

* $p < .05$; **$p < .01$; *** $p < .001$.

The results in Table 13 indicate that both having an absent father and being eligible for FSM, all significantly increased the likelihood of primary school mobility.

The prevalence rates for mobility by each of the groups are shown in the following tables. Table 10 shows the figures for KS1 mobility by FSM. Table 14 shows the average rate of KS1 mobility by family structure, specifically whether the father is present or absent from the family unit.

Table 14: Average rate of KS1 mobility by Family Structure

Family Structure	N	Average Rate of Mobility	s.d.
Father Absent	659	0.21	.41
Father Present	2049	0.15	.36

c) Composition of Mobility Groups: KS2

Similar analyses were conducted on the KS2 mobility group in order to identify any socio-demographic factors influencing its composition. The results are presented in Table 15.

Table 15: Significant Predictors for KS2 mobility (N =2648).

Significant Predictors	Logistic r	S.E.	Odds Ratio
Absent Father	.39	.13	1.47**
Ethnicity - Comparison Group White U.K.			
Ethnicity: White European	.46	.22	1.59*
Ethnicity: Black Caribbean	-.78	.29	0.46**
Highest Family socio-economic status (SES) Comparison Group - Skilled non-manual			
Professional non-manual	.40	.17	1.50*
Unskilled	.80	.30	2.22**
Never Worked	.57	.30	2.20**

* $p < .05$; ** $p < .01$; *** $p < .001$.

The results in Table 15 indicate that one ethnic group is less likely to be mobile during KS2 than those of white UK heritage – Black Caribbean, and one more likely – White European heritage, and Figure 2.2 shows the average rate of mobility for different ethnic groups in the sample, although numbers for some ethnic groups are small and results should be treated cautiously (see also table B.13 in Appendix B for further detail).

Figure 2.2: Average rate of KS2 mobility by Ethnicity

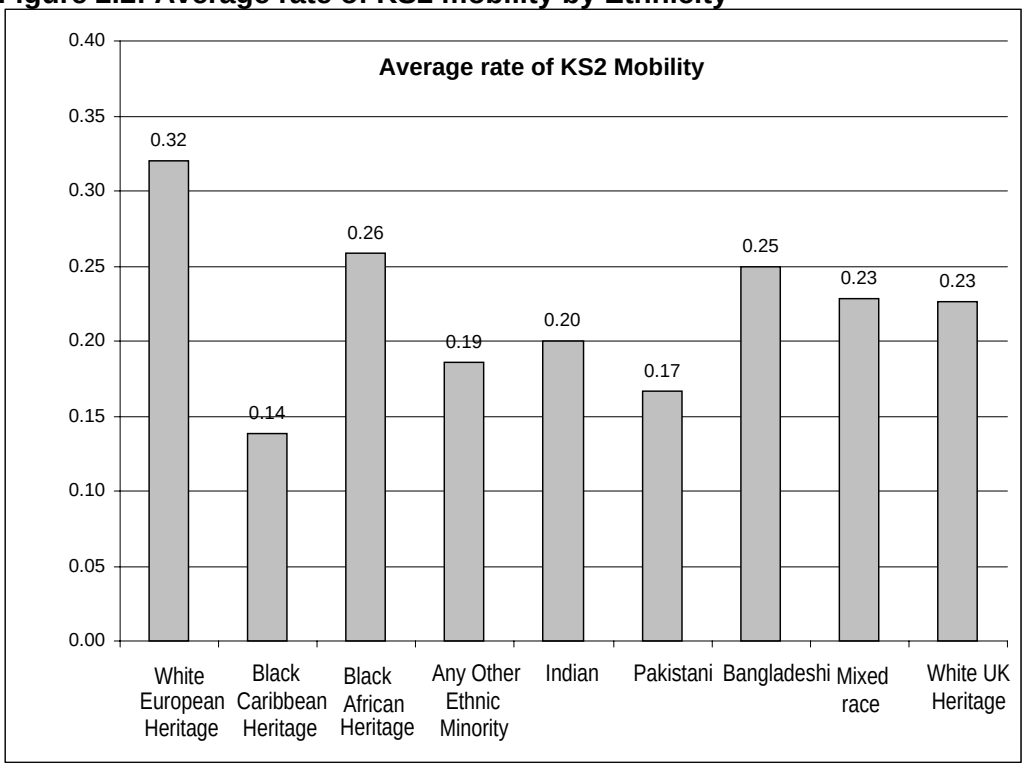


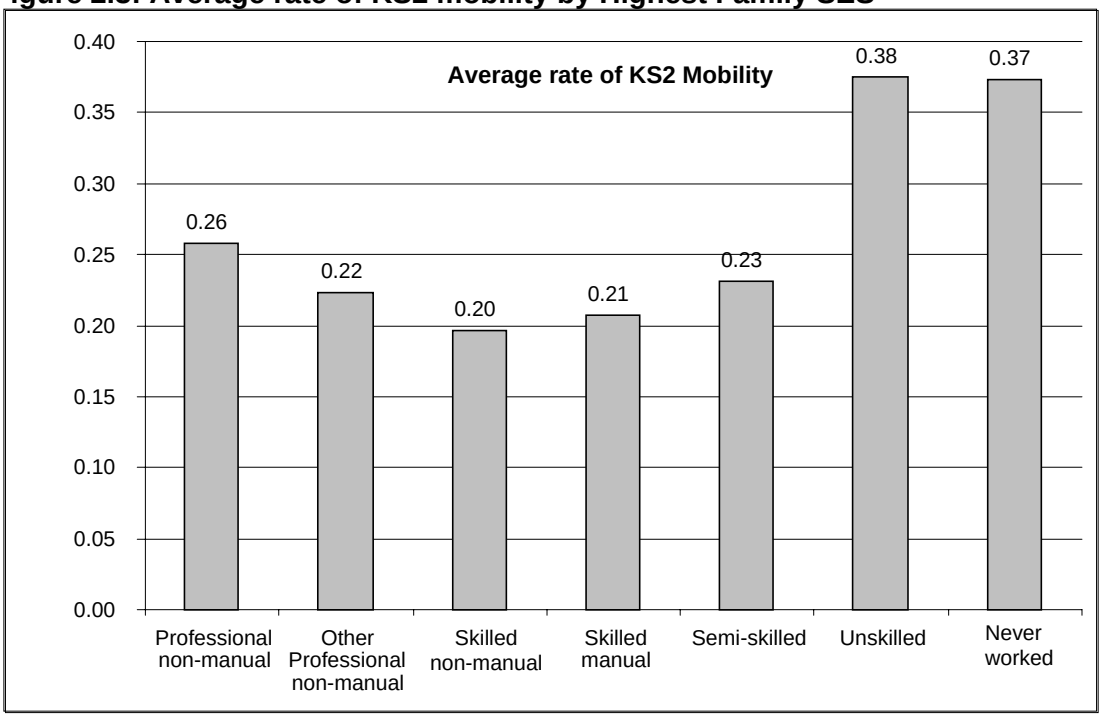
Table 16 shows the average rate of KS2 mobility by family structure, specifically whether the father is present or absent from the family unit, and mobility is slightly more likely if the father is absent (measured at age 6 years).

Table 16: Average rate of KS2 mobility by Family Structure

Family Structure	N	Average Rate of Mobility	s.d.
Father Absent	523	0.28	.45
Father Present	1948	0.21	.41

In terms of SES, compared to the largest and least mobile group, Skilled non-manual (n = 868), groups ranked above and below this reference group were more likely to be mobile during KS2, specifically Professional non-manual, Unskilled manual, and those who've Never worked. Table B.7 in Appendix B and Figure 2.3 (below) show the average rate of mobility by highest family socio-economic status (SES). Figure 2.3 especially shows the U-shaped distribution of mobility by SES, where the highest rates are amongst the Professional non-manual and the Unskilled and Never worked,, followed by the Professional non-manual: the lowest rates of mobility are found amongst the Skilled manual and Skilled non-manual.

Figure 2.3: Average rate of KS2 mobility by Highest Family SES



Summary: Composition of Mobility Groups

There is a clear distinction in terms of social advantage between the pre-school and KS1 mobility groups. The more qualified the mother of the EPPE 3-11 child, the more likely pre-school mobility; and eligibility for free school meals (FSM) the less likely pre-school mobility. This was reversed for KS1 mobility, which was more likely in the case of those eligible for FSM, and for those families with an absent father. The findings for KS1 mobility group's composition are consistent with previous research where mobility is associated with social disadvantage. However, the findings for pre-school mobility are new; little data has previously been available concerning such mobility, and the present research clearly indicates that 'mobility patterns' at the two different time points are entirely different in terms of the EPPE 3-11 child's family background.

Table 15 and Figure 2.3 show that there is no easy identification of social advantage or disadvantage with mobility during KS2, hence the absence of FSM as a predictor. Those families with absent fathers are likely to have higher rates of mobility, as with KS1, but the highest SES group – Professional non-manual also having high rates of KS2 mobility. However, with high rates of mobility associated with the Unskilled and Never worked SES groups too, mobility during KS2 shows a bias towards social disadvantage, although this is not as clear cut as during KS1.

Cognitive Outcomes: Pre-school Mobility

Progress over the pre-school period for three cognitive scores at the start of primary school (Reception), Early number concepts, Total Verbal ability and Pre-reading, are examined successively. Relevant background demographic factors and prior cognitive attainment are controlled, to allow the identification of any independent effects of mobility.

The descriptive statistics on pre-school Cognitive Measures scores appear in Table 17, higher scores indicating higher ability. The means also appear in Figures 3.1, 3.2 and 3.3.

Table 17: Descriptive statistics on Pre-school cognitive scores by Pre-school mobility

Cognitive Outcomes	Mobility Group	N	%	Mean	Std. Deviation
Early number concepts	**Mobility**	849	32.3	51.31	10.11
	Non-mobility	1782	67.7	49.70	10.15
	Total	**2631**	**100**		
Pre-reading	**Mobility**	848	32.1	50.76	9.60
	Non-mobility	1781	67.9	49.93	9.46
	Total	**2629**	**100**		
Total Verbal Ability	**Mobility**	850	32.1	51.42	8.60
	Non-mobility	1795	67.9	49.88	9.00
	Total	**2645**	**100**		

For each cognitive outcome taken at entry to reception two models were constructed: a basic demographic model, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measures. Any change in the model fit is also estimated: here 'fit' refers to the precision with which the model has reproduced the data; this is usually in terms of the variance –covariance matrix. – also see glossary The tables referred to in the remainder of this section with the prefix 'D' all appear in Appendix D

Figure 3.1: Mean Reception Early number concepts scores by Pre-school mobility

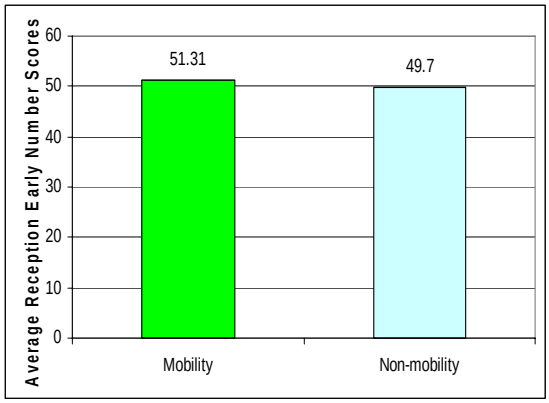


Figure 3.2: Mean Reception Pre-reading scores by Pre-school mobility

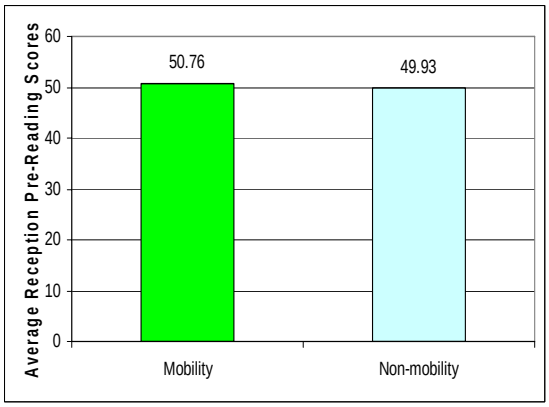
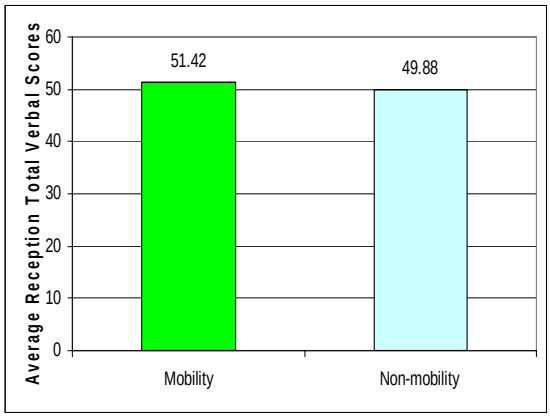


Figure 3.3: Mean Reception Total Verbal Ability scores by Pre-school mobility



a) Early number concepts

Results for Early number concepts indicated that inclusion of the pre-school mobility measure failed to significantly improve the model's fit: X^2= -0.36 (d.f.=1), p > 0.05. The properties of the models are shown in Table D.1.1. Inspection of the fixed effects for the model including the mobility measure did not indicate any differences between the mobility groups, details of which appear in Table D.1.2.

b) Pre-reading

As with Early number concepts, inclusion of the pre-school mobility measure, in the case of Pre-reading significantly improved the model's fit: X^2 = 4.92 (*d.f.* =1), p < 0.05. The properties of the models are shown in Table D.1.3. There were no differences identified between the mobility groups (see Table D.1.4).

c) Total Verbal ability

The same pattern of results was repeated for Total Verbal ability: inclusion of the pre-school mobility measure failed to significantly improve the model's fit: X^2 = -0.44 (*d.f.* 1), p > 0.05. The properties of the models are shown in Table D.1.5. There were no differences identified between the mobility groups (see Table D.1.6).

Summary: Pre-school cognitive outcomes

Table 18 presents the significant predictors for the three pre-school cognitive outcomes, it is important to note 'mobility' itself failed to reach significance for any of these measures as indicated in the final row.

Table 18: Significant Predictors for Pre-school Cognitive Measures

Variable	Early number concepts	Pre-reading	Total Verbal ability
Age at test		*	
Gender: Boys	*	*	
Block Building	*		
Verbal Comprehension	*		*
Picture Naming			*
Picture Similarities	*		
General Cognitive Ability		*	
Non-Verbal Composite	*	*	
Time at Centre	–	*	–
Number of Non-Parent Care Givers	–	*	
Development Problems	*	*	*
Father's Qualification	*	*	–
Family socio-economic status (SES)	*		*
Mother's Qualification	*	*	*
Eligibility for Free School Meals (FSM)		*	
Birth weight	*	*	
Siblings		*	
Ethnicity	*	*	*
Early years Home Learning Environment (HLE) Index	*	*	*
Duration of experience at pre-school	*		
% of Mother's with Degree by centre	*	–	*
Pre-school mobility			

* $p < .05$; – measure not used in model

Further analyses of Cognitive outcomes (at Entry to School - Reception) and mobility during Pre-school and KS1

Further analysis involved dividing the sample into four groups defined by mobility in the period from pre-school to the end of KS1:

1. no school move – that is no voluntary move during either the Pre-school period or KS1 but not including transition;
2. pre-school move only;
3. KS1 move only; and
4. move on both occasions, but not including involuntary transitions.

In this case, and in further instances of analysis, later mobility groups are included in the model. This has been done in order to assess whether those pupils who will eventually move schools show any evidence of poorer progress/ development at an earlier age – as poorer attainment/ progress/ development has been linked with mobility[9].

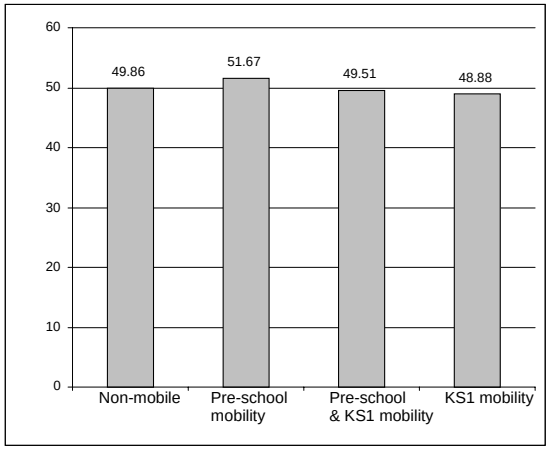
[9] Four group analyses of cognitive outcomes involved the subsequent inclusion of 'duration in months at pre-school' to control for greater opportunity for mobility for those who had greater opportunity to move, but it did not affect the findings in relation to mobility.

Descriptive statistics are presented in Table 19; the means are also shown in Figures 3.4, 3.5 and 3.6.

Table 19: Descriptive Statistics for Cognitive measures in Four Mobility Groups at Reception

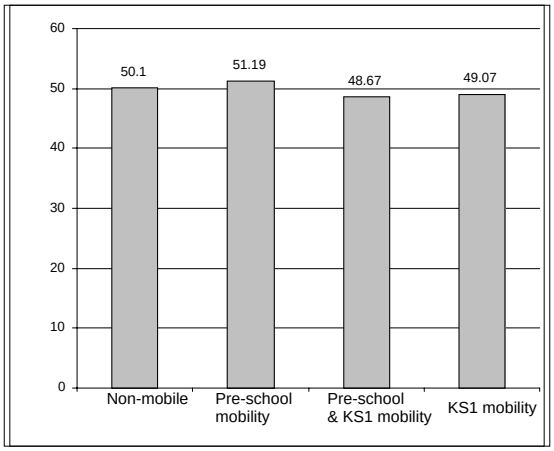
Cognitive Outcome	Mobility Group	N	%	Mean	Std. Deviation
Early number concepts	**Non-Mobility**	1480	56.3	49.86	10.06
	Pre-school Mobility	705	26.8	51.67	10.10
	Pre-school & KS1 Mobility	144	5.5	49.51	10.50
	KS1 Mobility	302	11.5	48.88	10.60
	Total	**2631**	**100**	-	-
Pre-reading	**Non-Mobility**	1479	56.3	50.10	9.48
	Pre-school Mobility	704	26.8	51.19	9.50
	Pre-school & KS1 Mobility	144	5.5	48.67	9.84
	KS1 Mobility	302	11.5	49.07	9.34
	Total	**2629**	**100**	-	-
Total Verbal Ability	**Non-Mobility**	1481	56.3	50.1	8.88
	Pre-school Mobility	705	26.8	51.8	8.52
	Pre-school & KS1 Mobility	144	5.5	49.59	8.68
	KS1 Mobility	306	11.5	48.16	9.19
	Total	**2636**	**100**	-	-

Figure 3.4: Mean Early number concepts scores in Four Mobility Groups at Reception



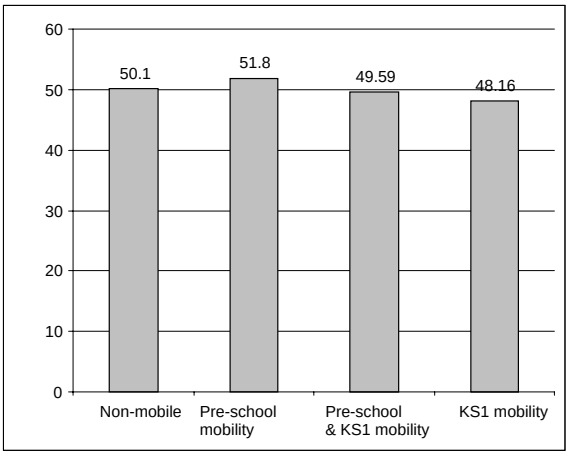
Average Reception Early number concepts scores

Figure 3.5: Mean Pre-reading scores in Four Mobility Groups at Reception



Average Reception Pre-reading scores

Figure 3.6: Mean Total Verbal Ability scores in Four Mobility Groups at Reception



a) Early number concepts

Results for Early number concepts indicated that inclusion of the pre-school mobility measure failed to significantly improve the model's fit: X^2 = 7.70 (*d.f.* 3), $p > 0.05$. The properties of the models are shown in Table D.1.7. Inspection of the fixed effects for the model including the mobility measure did not indicate any differences between the mobility groups.

b) Pre-reading

Inclusion of the pre-school mobility measure, in the case of Pre-reading significantly improved the model's fit: X^2 = 19.52 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table D.1.8. However, there were no differences identified between the mobility groups.

c) Total Verbal Ability

In the case of Total Verbal Ability, inclusion of the pre-school mobility measure significantly improved the model's fit: X^2 = 16.76 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table D.1.9. Differences were identified between the pre-school mobility group (which had the higher scores) and the KS1 mobility group, ES=0.20.

Summary

The division of children into four mobility groups, while pre-emptive in terms of two groups' future mobility does, in the case of Pre-reading and Total Verbal Ability scores, improve the model fit. However, two measures - Early number concepts and Pre-reading – did not indicate any differences between the four groups. This is important because they are direct precursors to the cognitive outcomes examined at KS1 – Mathematics and Reading (English) respectively. The Total Verbal score was the only measure where a significant difference was observed between two groups: the pre-school mobility group, with the higher scores, and the KS1 mobility group. Differences in raw Total Verbal Ability scores are likely to relate to differences in families' broad levels of social advantage as earlier research has shown that language scores at primary school entry are strongly predicted by such measures (Sammons et al., 2002), and we allow for such differences in our statistical models.

Cognitive Outcomes: KS1 Mobility

Children's cognitive scores in Reading and Mathematics are examined, and as with pre-school cognitive measures in each case relevant background demographic factors and prior cognitive attainment (the three pre-school cognitive measures) are controlled for in order to allow for any independent effects of mobility. Further analysis is also conducted in terms of testing for any independent effect of Pre-school mobility on the KS1 outcomes.

Descriptive statistics for the KS1 Reading and Mathematics scores by mobility group are presented initially, followed by the results of the multilevel analysis. The mean scores are presented in Table 20.

Table 20: Descriptive Statistics of Reading and Mathematics Scores by KS1 Mobility

Cognitive Outcome	Mobility Group	N	%	Mean	Std. Deviation
Reading	**Mobility**	311	13.7	98.62	14.8
	Non-mobility	1955	86.3	101.49	14.5
	Total	**2266**	**100**	-	-
Mathematics	**Mobility**	298	13.4	97.8	15.00
	Non-mobility	1925	86.6	101.56	14.67
	Total	**2223**	**100**	-	-

Table 20 indicates a slight elevation of mean scores for the non-mobility group during KS1 compared with the mobility group for both Reading and Mathematics. The means also appear in Figures 4.1 and 4.2.

Figure 4.1 Mean KS1 Reading score by Mobility Groups

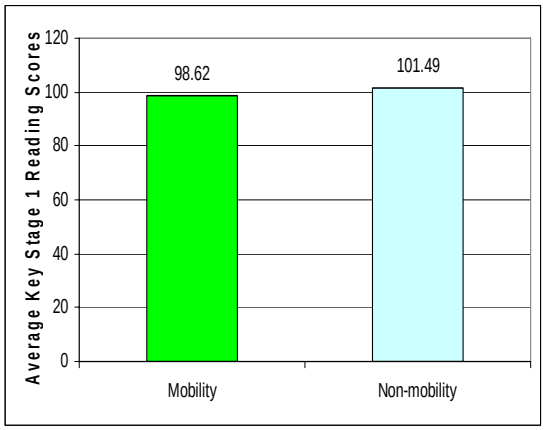
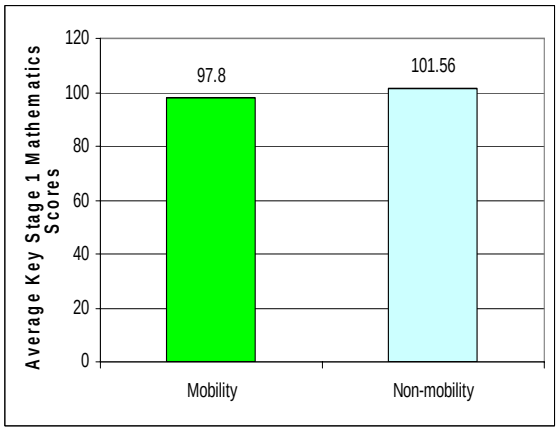


Figure 4.2: Mean KS1 Mathematics score by Mobility Group



Analysis for the KS1 cognitive outcomes involved the construction of two models, a basic demographic model, and a model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measures. The tables referred to in the remainder of this section with the pre-fix 'D' all appear in Appendix D.

a) Reading

Inclusion of the KS1 mobility measure, in the case of Reading, failed to significantly improve the model's fit: X^2 = 2.40 (*d.f.* 1), p > 0.05. The properties of the models are shown in Table D.2.3.; there were no differences identified between the mobility groups (see Table D.2.4).

b) Mathematics

Results for Mathematics indicated that inclusion of the KS1 mobility measure significantly improved the model's fit: X^2 = 9.62 (*d.f.* 1), p < 0.05. The properties of the models are shown in Table D.2.1. Inspection of the fixed effects for the model including the mobility measure indicated a near significant difference between the non-mobility group (with the higher scores) and the KS1 mobility group (p=0.058, ES=0.12), details appear in Table D.2.2.

Summary: KS1 Cognitive Measures

There was an identifiable improvement in model fit for Mathematics that was reflected in the near significant effect of KS1 mobility on progress in Mathematics. However, there was no such influence detected in the case of Reading. Table 21 presents the significant predictors for the two KS1 cognitive outcomes.

Table 21: Significant Predictors KS1 Cognitive Measures

Variable	Reading	Mathematics
Age		
Gender	*	*
Early numbers	*	*
Total Verbal	*	*
Pre-reading	*	*
Pattern recognition	*	*
Pattern construction	*	*
English as an additional language (EAL)	*	*
Ethnicity	*	–
Development Problems		
Family socio-economic status (SES)	*	*
Mother's Qualification	*	*
Father's Employment Status	*	*
Eligibility for Free School Meals (FSM)	*	
Birth weight	*	*
Early years Home Learning Environment (HLE) Index	*	*
KS1 mobility		

* $p < .05$; – measure not used in model

Further analyses of Cognitive outcomes and mobility during Pre-school and KS1

Further analysis involved dividing the sample into four groups covering the period from pre-school to the end of KS1, namely:

1. no school move;
2. pre-school move only;
3. KS1 move only; and
4. move on both occasions.

These divisions are introduced to further analyse the differences detected in progress/development for Mathematics in terms of mobility at different stages of the educational processes.

Descriptive statistics for the mobility groups appear in Table 22 followed by the results of the multilevel analysis.

Table 22: Descriptive Statistics for Cognitive measures for Four Mobility Groups at KS1

Cognitive Outcome	Mobility Group	N	%	Mean	Std. Deviation
Reading	Non-Mobility	1311	57.9	100.27	14.47
	Pre-school Mobility	644	28.4	103.96	14.17
	Pre-school & KS1 Mobility	98	4.3	97.62	15.00
	KS1 Mobility	213	9.4	99.08	15.09
	Total	2266	100	-	-
Mathematics	Non-Mobility	1293	58.2	100.60	14.66
	Pre-school Mobility	632	28.4	103.55	14.28
	Pre-school & KS1 Mobility	94	4.2	97.14	15.88
	KS1 Mobility	204	9.2	98.08	14.64
	Total	2223	100	-	-

The means for the mobility groups also appear in Figures 4.3 and 4.4.

Figure 4.3: Mean KS1 Reading scores by Mobility Group

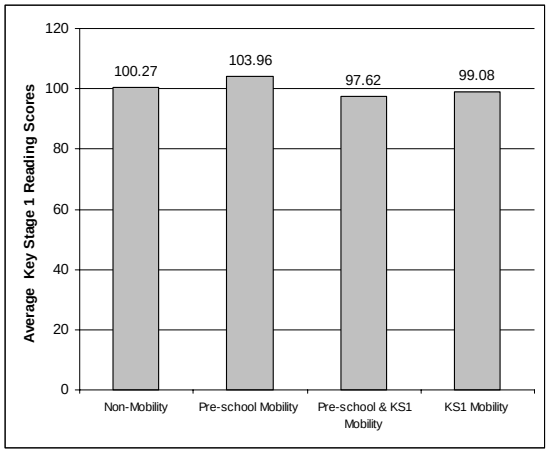
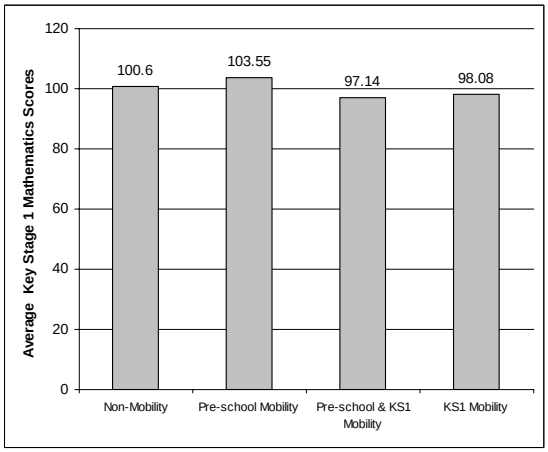


Figure 4.4: Mean KS1 Mathematics scores by Mobility Group



Analysis for the KS1 cognitive outcomes involved the construction of two models, a basic demographic model, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measures. The tables referred to in the remainder of this section with the pre-fix 'D' appear in Appendix D.

a) Reading

Inclusion of the KS1 mobility measure, in the case of Reading, significantly improved the model's fit: X^2 = 28.66 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table D.2.6. Differences were identified between the non-mobility group, with the lower scores and the Pre-school mobility group (ES = 18).

b) Mathematics

Results for Mathematics indicated that inclusion of the KS1 mobility measure significantly improved the model's fit: X^2 = 42.13 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table D.2.5. Inspection of the fixed effects for the model including the mobility measure indicated a significant difference between the pre-school mobility group (with the higher scores) and both the KS1 mobility group (ES=0.39), and the non-mobility group (ES=14).

Summary

There is clear evidence that by KS1 the pre-school mobility group make greater progress in Mathematics than those who moved school during KS1, although this difference does not extend to Reading. In terms of Mathematics outcomes, KS1 mobility is associated with poorer cognitive performance. This level of performance cannot be reduced to differences in an EPPE 3-11 child's socio-economic background, nor differences in prior attainment, as both these have been controlled in the analysis.

Cognitive Outcomes: KS2 Mobility

Children's KS2 cognitive scores in Reading and Mathematics are examined, using KS1 Reading and Mathematics as prior attainment and relevant background demographic factors.

Descriptive statistics for the Year 6 Reading and Mathematics scores by mobility group are presented initially, followed by the results of the multi-level analysis. The mean scores are presented in Table 23.

Table 23: Descriptive Statistics for Reading and Mathematics scores by KS2 Mobility Group

Cognitive Outcome	Mobility Group	N	%	Mean	Std. Deviation
Reading	Mobility	428	21	98.78	15.0
	Non-mobility	1702	79	101.59	14.6
	Total	**2130**	**100**	-	-
Mathematics	Mobility	420	20	99.65	13.99
	Non-mobility	1676	80	101.71	14.80
	Total	**2096**	**100**	-	-

Table 23 indicates an elevation of mean scores for the non-mobility group during KS2 compared with the Mobility group for both Mathematics and Reading. The means also appear in Figures 5.1 and 5.2.

Figure 5.2: Mean Reading score by KS2 Mobility Group

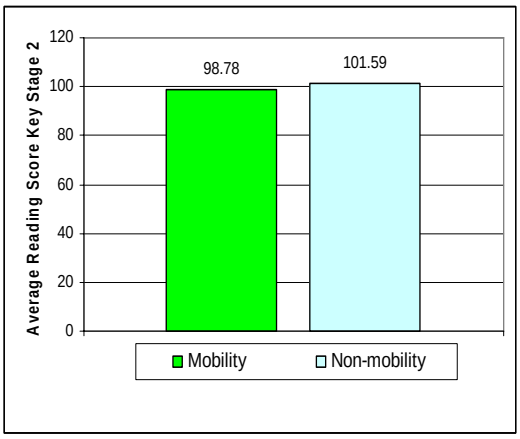
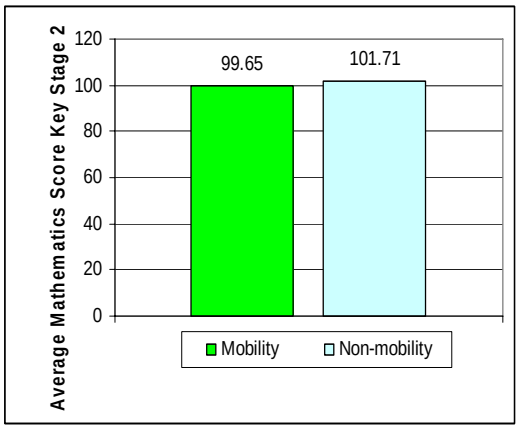


Figure 5.1 Mean Mathematics score by KS2 Mobility Group



Analysis for both outcomes involved the construction of two models, a basic demographic model accounting for Year 6 scores, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measure.

a) Reading

Results for Reading indicated that inclusion of the KS2 mobility measure significantly improved the model's fit: X^2 = 7.50 (*d.f.* 2), p < 0.05. A summary of the significant effects are presented in Table D.1.3. The difference between the two groups only approached significance (p=0.056), although of the two the non-mobility group had the higher scores: ES=0.08. The fixed effects for the mobility measure model are presented in Table D.1.4.

b) Mathematics

Results for Mathematics indicated that inclusion of the KS2 mobility measure significantly improved the model's fit: X^2 = 10.28 (*d.f.* 2), p < 0.05. The mobility group had significantly lower progress in Mathematics than the non-mobility group, ES=0.27. A summary of the significant effects are presented in Table D.1.1 and details of the fixed effects for the mobility measure model are presented in Table D.1.2.

Summary: KS2 Cognitive Measures

There was an improvement in model fit for both Reading and Mathematics. This was reflected in the significant effect of mobility on progress for Mathematics. Table 24 presents the significant predictors for the KS2 cognitive outcomes. It is clear in the case of Mathematics that when controlling for prior attainment, by KS2, little else is left with explanatory power, save mother's qualifications, HLE, and mobility. The pattern is similar for Reading although in this case SES and gender are also important.

Table 24: Significant Predictors KS2 Cognitive Measures

Variable	Reading	Mathematics
Mathematics Year 2	*	*
Age		
Gender	*	
Eligibility for Free School Meals (FSM)		
English as an additional language (EAL)		
Development Problems		
Birth weight		
Ethnicity		
Income		
Family socio-economic status (SES)	*	
Mother's Qualification	*	*
Father's Qualification		
Early Years Home Learning Environment (HLE) Index	*	*
KS1 Home Learning Environment (HLE) Interactions		*
KS1 Home Learning Environment (HLE) Computer Use	*	–
KS2 Mobility		*

* p < .05; – measure not used in model

Further analyses of Cognitive outcomes and mobility from Pre-school to KS2

Further analysis involved dividing the sample into four groups covering the period from pre-school to the end of KS2 namely:

1. no school move;
2. pre-school move only;
3. KS2 move only; and
4. move on both occasions.

These divisions are introduced to further analyse the differences detected in progress/development for Mathematics in terms of mobility at different stages of the educational processes.

Descriptive statistics for the mobility groups appear in Table 25 followed by the results of the multilevel analysis.

Table 25a: Descriptive Statistics for Cognitive measures for Four Mobility Groups at KS2

Cognitive Outcome	Mobility Group	N	%	Mean	Std. Deviation
Reading	Non-Mobility	1199	56	100.97	14.50
	Pre-school Mobility	503	24	103.07	14.60
	Pre-school & KS2 Mobility	157	7	100.46	14.46
	KS2 Mobility	271	13	97.80	15.32
	Total	**2130**	**100**	-	-
Mathematics	Non-Mobility	1182	56	101.16	13.99
	Pre-school Mobility	494	24	102.65	14.66
	Pre-school & KS2 Mobility	155	7	101.52	14.29
	KS2 Mobility	265	13	98.10	13.58
	Total	**2096**	**100**	-	-

The means for the mobility groups also appear in Figures 5.3 and 5.4

Figure 5.3: Mean KS2 Reading scores by Mobility Group

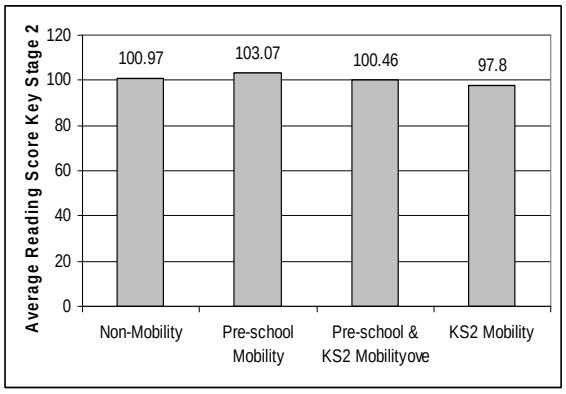
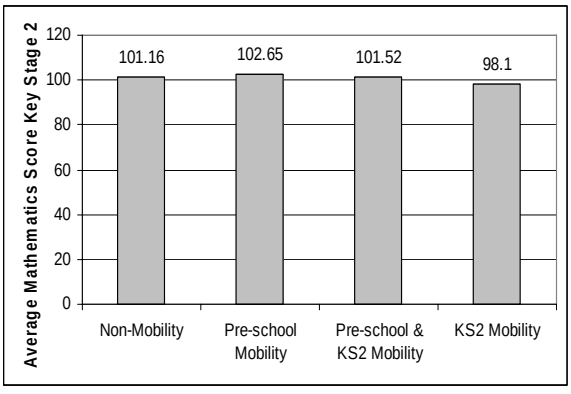


Figure 5.4: Mean KS2 Mathematics scores by mobility group



Analysis for the KS2 cognitive outcomes involved the construction of two models, a basic demographic model, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measures. The tables referred to in the remainder of this section with the pre-fix 'D' all appear in Appendix D.

a) Reading

Inclusion of the KS2 mobility measure, in the case of Reading, significantly improved the model's fit: X^2 = 15.46 (*d.f.* 2), $p < 0.05$. The properties of the models are shown in Table D.3.6.

Inspection of the fixed effects for the model including the mobility measure indicated a significant difference between the pre-school mobility group (with the higher scores) and the pre-school and KS2 mobility group (ES=0.24).

b) Mathematics

Results for Mathematics indicated that inclusion of the KS2 mobility measure significantly improved the model's fit: $X^2 = 13.56$ (*d.f.* 2), $p < 0.05$. The properties of the models are shown in Table D.3.5. Inspection of the fixed effects for the model including the mobility measure indicated a significant difference between the pre-school mobility group (with the higher scores) and the pre-school and KS2 mobility group (ES=0.19).

Summary

There is clear evidence that by KS2 the pre-school mobility group make greater progress in Reading and Mathematics than the most peripatetic or mobile EPPE 3-11 children – those who moved both during pre-school and primary school during KS2. This level of performance cannot be reduced to differences in an EPPE 3-11 child's socio-economic background, nor differences in prior attainment, as both these have been controlled in the analysis.

Further analyses of Cognitive outcomes and mobility during KS1 and KS2

Further analysis involved dividing the sample into four groups covering the period from the beginning of KS1 to the end of KS2 namely:

5. no school move;
6. KS1 move only;
7. KS2 move only; and
8. move on both occasions.

These divisions are introduced to further analyse the differences detected in progress/development for Mathematics in terms of mobility at different stages of the educational processes.

Descriptive statistics for the mobility groups appear in Table 25b followed by the results of the multilevel analysis.

Table 25b: Descriptive Statistics for Cognitive measures for Four Mobility Groups at KS2

Cognitive Outcome	Mobility Group	N	%	Mean	Std. Deviation
Reading	**Non-Mobility**	1535	71.0	101.62	14.61
	KS1 Mobility	202	9.30	100.16	14.29
	KS2 Mobility	354	16.30	99.18	15.20
	KS1 and KS2 Mobility	74	3.42	96.84	12.37
	Total	**2165**	**-**	-	-
Mathematics	**Non-Mobility**	1512	71.0	101.84	14.23
	KS1 Mobility	197	9.25	100.10	14.04
	KS2 Mobility	348	16.35	99.15	13.68
	KS1 and KS2 Mobility	72	3.38	96.23	14.64
	Total	**2129**	**-**	-	-

The means for the mobility groups also appear in Figures 5.5 and 5.6

Figure 5.5: Mean KS2 Reading scores by Mobility Group

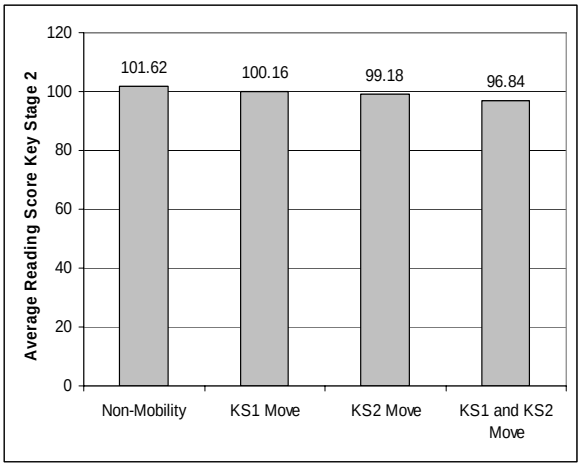
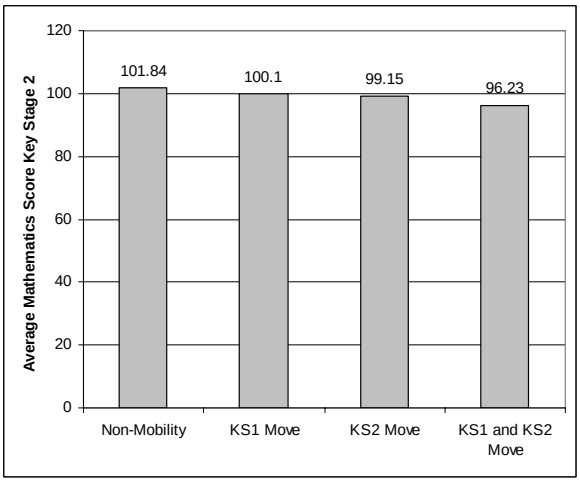


Figure 5.5: Mean KS2 Mathematics scores by mobility group



Analysis for the KS2 cognitive outcomes involved the construction of two models, a basic demographic model, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measures. The tables referred to in the remainder of this section with the pre-fix 'D' all appear in Appendix D.

a) Reading

Inclusion of the KS2 mobility measure, in the case of Reading, did not significantly improve the model's fit: X^2 = 8.66 (*d.f.* 4), $p > 0.05$. The properties of the models are shown in Table D.3.7. Inspection of the fixed effects for the model including the mobility measure indicated a near significant difference (p = 0.056) between the non-mobility group (with the higher scores) and the KS2 only mobility group (ES=0.13).

b) Mathematics

Results for Mathematics indicated that inclusion of the KS2 mobility measure significantly improved the model's fit: X^2 = 11.84 (*d.f.* 4), $p < 0.05$. The properties of the models are shown in Table D.3.8. Inspection of the fixed effects for the model including the mobility measure indicated a significant difference between the non-mobility group (with the higher scores) and the KS2 only mobility group (ES=0.16).

Summary

There is clear evidence that by KS2 the children mobile during KS2 are making poorer progress than the non-mobile children in mathematics, however, those only mobile during KS1 were not making significantly poorer progress. It is important to consider this group's social/ behavioural outcomes, which are examined in following sections.

Social/behavioural outcomes: Pre-school mobility

Progress over the pre-school period for four social/behavioural outcomes, 'Co-operation & Conformity'; 'Independence & Concentration'; 'Peer Sociability'; and 'Anti-social' behaviour, are examined successively. In each case relevant background demographic factors and prior cognitive attainment are controlled for, in order to allow for any independent effects of mobility to be detected.

Descriptive statistics for the pre-school Social/behavioural outcomes by mobility group are presented initially, followed by the results of the multilevel analysis. The descriptive statistics are presented in Table26, and the means in Figures 6.1 to 6.2.

Table 26: Descriptive statistics on Pre-school social/behavioural outcomes by Pre-school mobility

Social/behavioural Outcome	Mobility	N	%	Mean	Std. Deviation
'Co-operation & Conformity'	**Mobility**	815	31.8	3.91	.80
	Non-mobility	1750	68.2	3.92	.84
	Total	**2565**	**100**		
'Independence & Concentration'	**Mobility**	814	31.8	3.54	.80
	Non-mobility	1745	68.2	3.54	.84
	Total	**2559**	**100**		
'Peer Sociability'	**Mobility**	815	31.8	3.69	.70
	Non-mobility	1750	68.2	3.63	.72
	Total	2565	100		
'Anti-social' behaviour	**Mobility**	815	31.8	1.76	.68
	Non-mobility	17549	68.2	1.73	.65
	Total	**2564**	**100**		

The means for each outcome are presented in Figures 6.1 to 6.4.

Figure 6.1: Mean 'Cooperation & Conformity' score by Pre-school Mobility

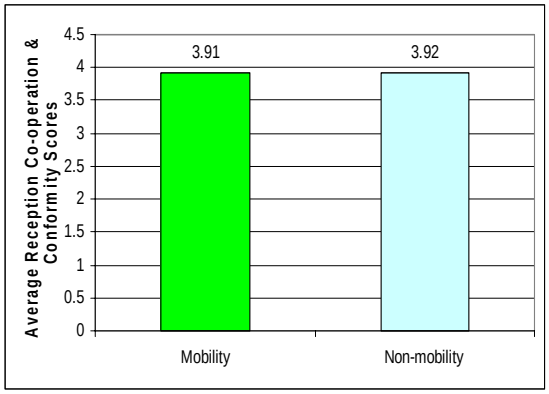


Figure 6.2: Mean 'Independence & Concentration' score by Pre-school Mobility

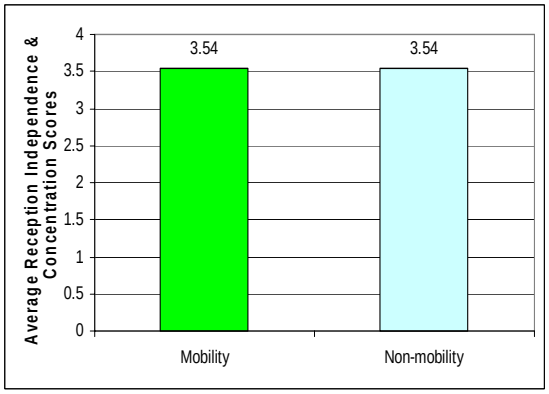


Figure 6.3: Mean 'Peer Sociability' score by Pre-school mobility

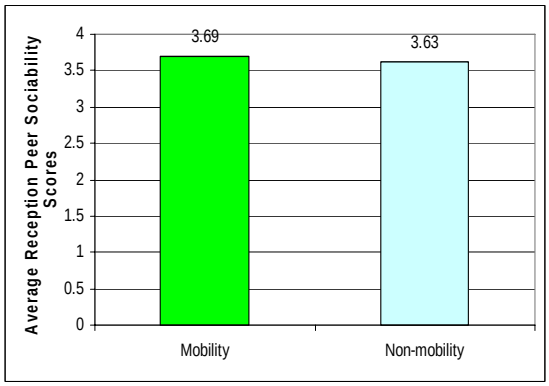
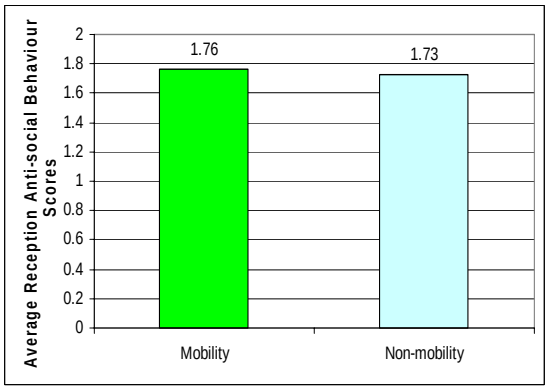


Figure 6.4: Mean 'Anti-social' behaviour score by Pre-school mobility



For each outcome the analysis involved the construction of two models, a basic demographic model, and a subsequent model incorporating the mobility measure. Through the remainder of this section all Tables pre-fixed with 'E' are located in Appendix E.

a) 'Co-operation & Conformity'

Results for 'Co-operation and Conformity' indicated that inclusion of the pre-school mobility significantly improved the model's fit: X^2 = 27.48 (*d.f.* 1), $p < 0.05$. The properties of the models are shown in Table E.1.1. Inspection of the fixed effects for the mobility measure model did not, however, indicate any differences between the mobility groups; see Appendix E, Table E.1.2.

b) 'Independence & Concentration'

The inclusion of the pre-school mobility significantly improved the model's fit: X^2 = 10.0 (*d.f.* 1), $p < 0.05$ (i.e. improved fit means that the model fits the patterns in the data better and hence is preferable). The properties of the models are shown in Table E.1.3. Inspection of the fixed effects for the mobility measure model did not, however, indicate any differences between the mobility groups; see Table E.1.4.

c) 'Peer Sociability'

The inclusion of the pre-school mobility in the case of 'Peer Sociability' significantly impoverished the model's fit: X^2 = -9.54 (*d.f.* 1), $p < 0.05$. The properties of the models are shown in Table E.1.5. Inspection of the fixed effects for the mobility measure model did not indicate any differences between the mobility groups; see Table E.1.6

d) 'Anti-social' behaviour

As with 'Peer sociability', the inclusion of the pre-school mobility in the case of 'Anti-social' behaviour significantly impoverished the model's fit: $X^2 = -10.64$ (d.f. 1), $p < 0.05$. The properties of the models are shown in Table E.1.7. Inspection of the fixed effects for the mobility measure model did not indicate any differences between the mobility groups; see Table E.1.8.

Summary: Pre-school social/behavioural outcomes

Table 27 presents the significant predictors for the pre-school Social/behavioural outcomes, where, despite improved model fit in some cases, mobility failed to reach significance on any of these measures as indicated in the final row.

Table 27: Significant Predictors for Reception Social Behavioural Outcomes

Reference Group	'Co-operation & Conformity'	'Independence & Concentration'	'Peer Sociability'	'Anti-social' behaviour
Age at test	*	*	*	*
Gender: Boys	*	*	–	
'Co-operation & Conformity'	*	*		*
'Peer Sociability'			*	
'Confidence'	*		*	*
'Anti-social' behaviour	*		*	*
'Worried/upset'				
English as an additional language (EAL)				*
Development Problems	*	*	*	
Behavioural Problems	*		*	*
Family Socio-economic Status (SES)	–	–		
Father's Employment Status	–	–	*	
Father's Qualifications	*	*	–	
Mother's Qualification	*	*	–	-
Eligibility for Free School Meals (FSM)	*	*	–	–
Birth weight		*	–	
Siblings	*	*		*
Frequency of help sought with Behavioural/ Developmental problems during Pre-school		*	–	–
Ethnicity		–	*	
Duration at Pre-school Centre	–	–	–	*
Regular bedtimes	–	–	–	
Home Learning Environment (HLE) Index	*	*	*	
Pre-school mobility				

* $p < .05$; – measure not used in model

Further analyses of social/behavioural outcomes (at the Entry to school – Reception) and mobility during Pre-school and KS1

Further analysis involved dividing the sample into four groups covering the period from pre-school to the end of KS1:

1. no school move;
2. pre-school move only;
3. KS1 move only; and
4. move on both occasions.

These divisions are introduced because mobility during KS1 is associated with lower levels of cognitive attainment/ progress, and the following analysis is applied in order to establish whether possible differences are accompanied by differences in Social/behavioural development. Consequently, the analysis will indicate whether any differences between these groups, possibly apparent at KS1, in social/behavioural development, are evident at start of Reception. Descriptive statistics appear in Table 28.

Table 28: Descriptive Statistics for social/behavioural measures on Four Mobility Groups at Entry to Reception

Cognitive Outcome	Mobility Group	N	%	Mean	Std. Deviation
'Independence & Concentration'	**Non-Mobility**	1457	56.9	3.55	.83
	Pre-school Mobility	678	26.5	3.59	.78
	Pre-school & KS1 Mobility	136	5.3	3.30	.84
	KS1 Mobility	288	11.3	3.46	.88
	Total	**2559**	**100**	-	-
'Co-operation & Conformity'	**Non-Mobility**	1460	56.9	3.93	.67
	Pre-school Mobility	679	26.5	3.94	.69
	Pre-school & KS1 Mobility	136	5.3	3.73	.70
	KS1 Mobility	290	11.3	3.82	.72
	Total	**2565**	**100**	-	-
'Peer Sociability'	**Non-Mobility**	1460	56.9	3.63	.71
	Pre-school Mobility	679	26.5	3.71	.69
	Pre-school & KS1 Mobility	136	5.3	3.59	.71
	KS1 Mobility	290	11.3	3.64	.73
	Total	**2565**	**100**		
'Anti-Social' behaviour	**Non-Mobility**	1459	56.9	1.71	.63
	Pre-school Mobility	679	26.5	1.73	.66
	Pre-school & KS1 Mobility	136	5.3	1.88	.71
	KS1 Mobility	290	11.3	1.80	.70
	Total	**2564**	**100**		

The average scores for 'Independence & Concentration', 'Co-operation & Conformity', 'Peer Sociability' and 'Anti-social/Worried' appear in Figures 6.5 to 6.8, followed by the results of the analysis for these factors.

Figure 6.5: Mean 'Independence & Concentration' scores for Four Mobility Groups at Reception

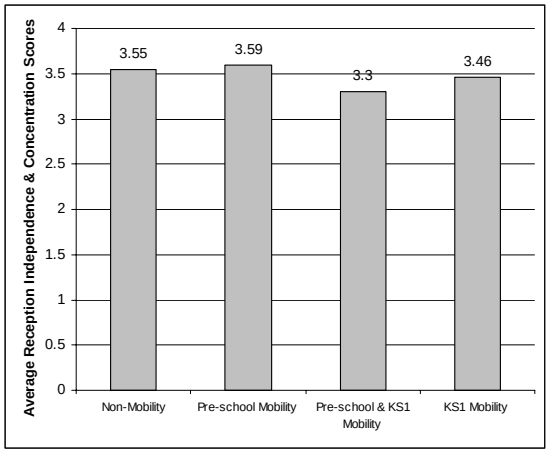


Figure 6.6: Mean 'Co-operation & Conformity' scores for Four Mobility Groups at Reception

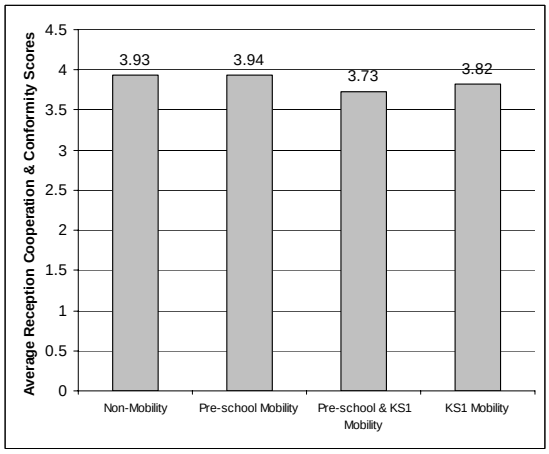


Figure 6.7: Mean 'Peer Sociability' scores for Four Mobility Groups at Reception

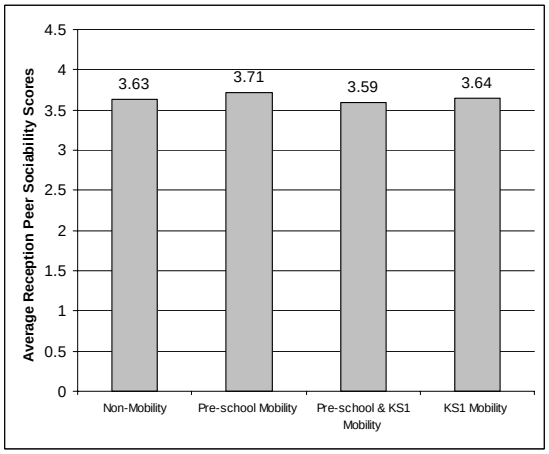
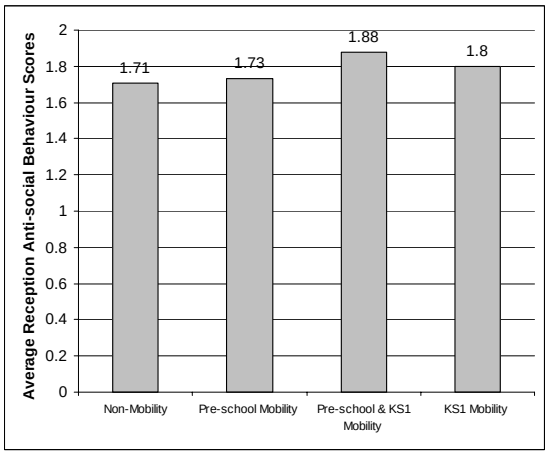


Figure 6.8: Mean 'Anti-social' behaviour scores for Four Mobility Groups at Reception



Analysis for the four social/behavioural outcomes measured at Reception involved the construction of two models, a basic demographic model, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measures. The tables with the prefix 'E' referred to in the remainder of this section all appear in Appendix E.

a) 'Co-operation and Conformity'

The results indicated that inclusion of the pre-school mobility measure significantly improved the model's fit: X^2 = 9.12 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.1.9. Inspection of the fixed effects for the model including the mobility measure in did not indicate any differences between the mobility groups.

b) 'Independence and Concentration'

The results for 'Independence and Concentration' indicated that inclusion of the pre-school mobility measure significantly improved the model's fit: X^2 = 12.16 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.1.10. Inspection of the fixed effects for the model including the mobility measure in did not indicate any differences between the mobility groups.

c) 'Peer Sociability'
In the case of 'Peer Sociability' the inclusion of the mobility measure actually impoverished the model's fit: X^2 = -21.34 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.1.11. Inspection of the fixed effects for the model including the mobility measure in did not indicate any differences between the mobility groups.

d) 'Anti-social' behaviour
As with 'Peer Sociability', the inclusion of the mobility measure actually impoverished the model's fit: X^2 = -20.08 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.1.12. Inspection of the fixed effects for the model including the mobility measure in did not indicate any differences between the mobility groups.

Summary
The division of mobility into four groups does not improve any of the models' fit and actually impoverishes the fit when compared with the simple demographic model in the case of 'Peer Sociability' and 'Anti-social/worried'. Furthermore, there were no differences identified between the groups in any of the models. At Reception mobility is largely irrelevant in terms of explaining EPPE 3-11 children's social/behavioural development.

Social/behavioural outcomes: KS1

The social/behavioural outcomes for Key Stage 1 (KS1; Year 2) were examined for any influence of Mobility, initially in terms of descriptive statistics and latterly the application of multilevel models, initially a model excluding Mobility but including all demographic items and the HLE found to be significant predictors of the given social/behavioural construct (Sammons et al., 2004) along with the Reception social/behavioural constructs ('Independence & Concentration', 'Co-operation & Conformity', 'Peer Sociability', 'Anti-social' behaviour, 'Peer Empathy' and 'Confidence').

Descriptive statistics for the KS1 social/behavioural scores by mobility group are presented in Table 29.

Table 29: Frequency and Mean KS1 social/behavioural score by mobility

Cognitive Outcome	Mobility	N	%	Mean	Std. Deviation
'Self-regulation'	**Mobility**	294	13.1	2.24	.56
	Non-mobility	1944	86.9	2.38	.50
	Total	**2238**	**100**		
'Pro-social' behaviour	**Mobility**	295	13.1	2.37	.49
	Non-mobility	1952	86.9	2.52	.46
	Total	**2247**	**100**		
'Anxious' behaviour	**Mobility**	295	13.2	1.30	.42
	Non-mobility	1948	86.8	1.29	.38
	Total	**2243**	**100**		
'Anti-social' behaviour	**Mobility**	295	13.1	1.36	.41
	Non-mobility	1949	86.9	1.27	.35
	Total	**2244**	**100**		

Table 29 indicates the mean scores for the mobility and non-mobility groups during KS1. The means also appear in Figures 7.1 to 7.4. Analysis for each construct involved the construction of two models, a basic demographic model accounting for the given KS1 social/behavioural outcome, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the given outcome.

Figure 7.1: Mean 'Self-regulation' scores at KS1 by mobility group

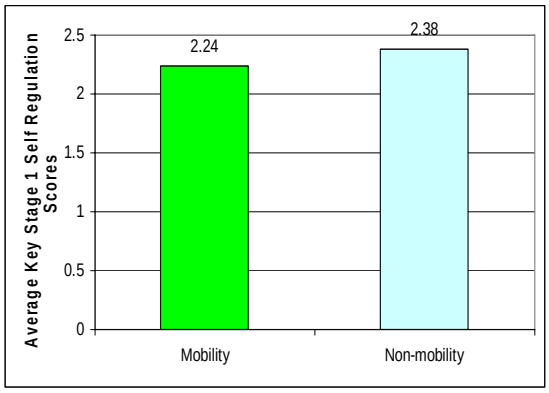


Figure 7.2: Mean 'Pro-social' behaviour scores at KS1 mobility group

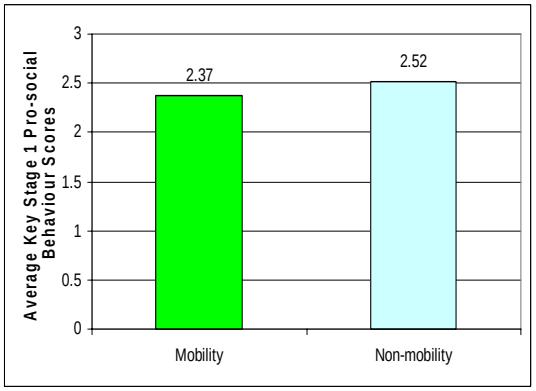


Figure 7.3: Mean 'Anxious' behaviour scores at KS1 by mobility group

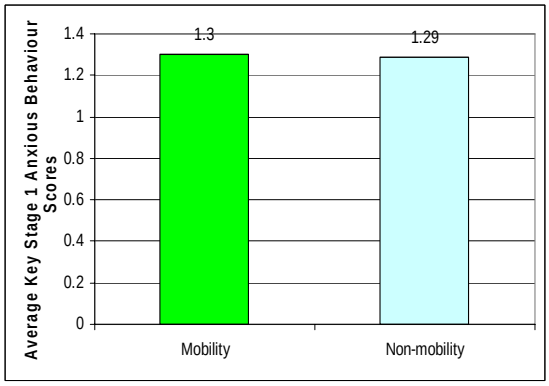
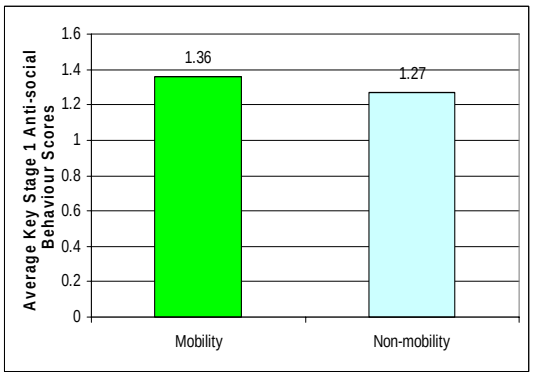


Figure 7.4: Mean 'Anti-social' behaviour scores at KS1 by mobility group



Analysis of the four social/behavioural outcomes measured at KS1 involved the construction of two models, a basic demographic model, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measures. The tables with the prefix 'E' referred to in the remainder of this section all appear in Appendix E.

a) 'Self-regulation'

The Results for 'Self-regulation' indicated that inclusion of the KS1 mobility measure significantly improved the model's fit: X^2 = 5.04 (*d.f.* 1), $p < 0.05$. The properties of the models are shown in Table E.2.1. However, inspection of the fixed effects for the model including the mobility measure indicated the mobility group recorded significantly lower Self-regulation score than the non-mobility group, ES=0.18. (See Table E.2.2).

b) 'Pro-social' behaviour

The results indicated that the inclusion of the KS1 mobility measure significantly improve the model's fit: X^2 = 17.72 (*d.f.* 1), $p < 0.05$. The properties of the models are shown in Table E.2.3. Inspection of the fixed effects for the model including the mobility measure indicated the mobility group recorded significantly lower 'Pro-social' behaviour scores than the non-mobility group ES=0.21. (See Table E.2.4).

c) 'Anxious' behaviour

In the case of 'Anxious' behaviour the inclusion of the mobility measure actually impoverished the model's fit: X^2 = -10.54 (*d.f.* 1), $p < 0.05$. The properties of the models are shown in Table E.2.5. Inspection of the fixed effects for the model including the mobility measure did not indicate any differences between the mobility groups. (See Table E.2.6).

d) 'Anti-social' behaviour

The inclusion of the mobility measure significantly improved the model's fit: X^2 = 5.26 (*d.f.* 1), p < 0.05. The properties of the models are shown in Table E.2.7. Inspection of the fixed effects for the model including the mobility measure did not indicate any differences between the mobility groups, although the result approached significance (p = 0.65) with the higher scores belonging to the mobility group, ES= 0.12. (See Table E.2.8).

Summary: KS1 social/behavioural outcomes

Table 30 presents the significant predictors of for the four KS1 social/behavioural outcomes. KS1 mobility proved significant in the case of 'Self-regulation' and 'Pro-social' behaviour, with lower scores associated with mobility.

Table 30: Significant Predictors for KS1 social/behavioural outcomes

Reference Group	'Self-regulation'	'Pro-social' behaviour	'Anxious' behaviour	'Anti-social' behaviour
Age at test	*			
Gender: Boys	*	*	*	*
'Independence & Concentration'	*	*		*
'Co-operation & Conformity'	*	*		*
'Peer Sociability'			*	*
'Anti-Social' behaviour		*	*	
'Peer Empathy'				*
'Confidence'				*
Development problems		–	–	
Behavioural problems	*			
Family socio-economic status (SES)	*		–	*
Mother's Employment	–		*	*
Mother's Qualification	*	–	–	*
Marital Status	–	–	–	*
Eligibility for Free School Meals (FSM)	*	*	–	
Birth weight			–	*
Ethnicity	–		–	–
Early Years Home Learning Environment (HLE) Index			–	*
KS1 mobility	*	*		

* $p < .05$; – measure not used in model

Further analyses of social/behavioural outcomes and mobility during Pre-school and KS1

Further analysis involved dividing the sample into four groups covering the period from pre-school to the end of KS1:

1. no school move;
2. pre-school move only;
3. KS1 move only; and
4. move on both occasions.

These divisions are introduced because mobility during KS1 is associated with lower levels of cognitive attainment/progress, and the following analysis is applied in order to establish whether any such possible differences are accompanied by differences in social/behavioural development.

Table 31: Descriptive Statistics for social/behaviour measures Four Mobility Groups at KS1

Cognitive Outcome	Mobility Group	N	%	Mean	Std. Deviation
'Self-regulation'	**Non-Mobility**	1326	59.2	2.35	.51
	Pre-school Mobility	618	27.6	2.44	.47
	Pre-school & KS1 Mobility	92	4.1	2.15	.54
	KS1 Mobility	202	9.0	2.27	.55
	Total	**2238**	**100**		
'Pro-social' behaviour	**Non-Mobility**	1331	59.2	2.49	.47
	Pre-school Mobility	621	27.6	2.56	.43
	Pre-school & KS1 Mobility	92	4.1	2.28	.51
	KS1 Mobility	203	9.0	2.41	.47
	Total	**2247**	**100**		
'Anxious' behaviour	**Non-Mobility**	1329	59.2	1.29	.38
	Pre-school Mobility	619	27.6	1.27	.35
	Pre-school & KS1 Mobility	92	4.1	1.32	.40
	KS1 Mobility	203	9.0	1.31	.43
	Total	**2243**	**100**		
'Anti-social' behaviour	**Non-Mobility**	1329	59.2	1.28	.36
	Pre-school Mobility	620	27.6	1.24	.33
	Pre-school & KS1 Mobility	92	4.1	1.4	.45
	KS1 Mobility	203	9.0	1.33	.39
	Total	**2244**	**100**		

The means for the Social/behavioural measures appear in the following Figures 7.5 to 7.8.

Figure 7.5: Mean KS1 'Self-regulation' scores by mobility group

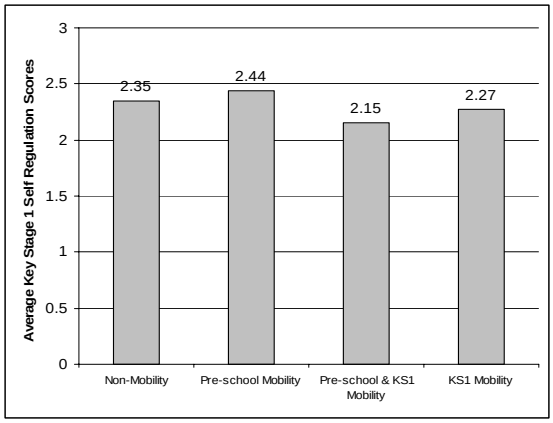


Figure 7.6: Mean KS1 'Pro-social' behaviour scores by mobility group

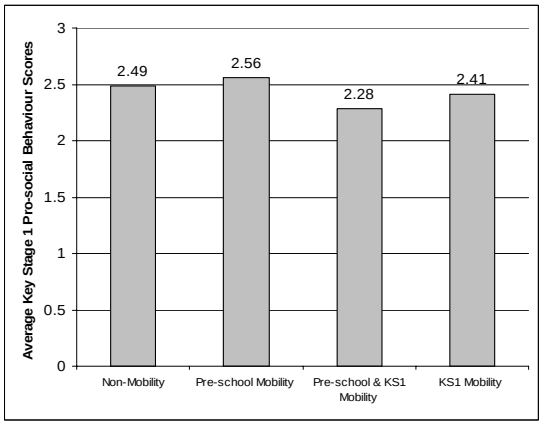


Figure 7.7: Mean KS1 'Anxious' behaviour scores by mobility group

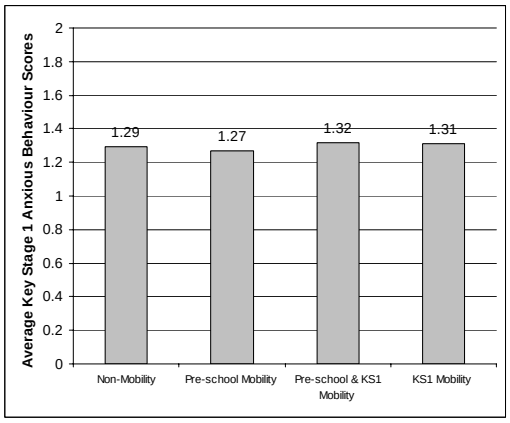
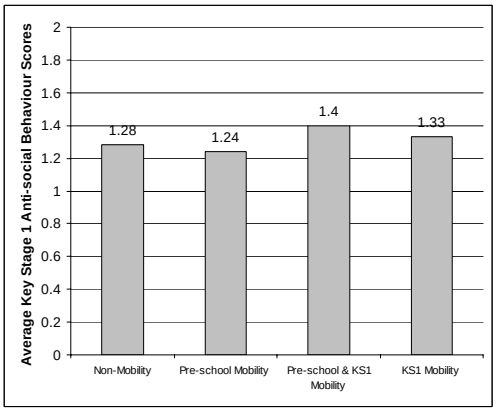


Figure 7.8: Mean KS1 'Anti-social' behaviour scores by mobility group



The mobility models detailed in the preceding section were replicated exactly for each of the four social/behavioural outcomes with the exception that the mobile/non-mobile distinction was replaced with the four group mobility split specified above.

The mobility models detailed in the preceding section were replicated exactly for each of the three cognitive outcomes with the exception that the mobile/non-mobile distinction was replaced with the four group mobility split specified above.

a) 'Self-regulation'

The results for 'Self-regulation' indicated that inclusion of the KS1 mobility measure did not significantly improve the model's fit: $X^2 = 3.78$ (*d.f.* 3), $p > 0.05$. The properties of the models are shown in Table E.2.9. Inspection of the fixed effects for the model indicated the difference was between the pre-school mobility group, that had the higher scores, and the KS1 mobility group, ES=0.21.

b) 'Pro-social' behaviour

The results indicated that the inclusion of the KS1 mobility measure did not significantly improve the model's fit: $X^2 = 3.16$ (*d.f.* 3), $p > 0.05$. The properties of the models are shown in Table E.2.10. Inspection of the fixed effects for the model, however, did indicate a significant difference was between the pre-school mobility group, that had the higher scores, and the KS1 mobility group, ES=0.23.

c) 'Anxious' behaviour

In the case of 'Anxious' behaviour the inclusion of the mobility measure actually impoverished the model's fit: X^2 = -30.52 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.2.11. Inspection of the fixed effects for the model including the mobility measure did not indicate any differences between the mobility groups.

d) 'Anti-social' behaviour

The inclusion of the mobility measure significantly improved the model's fit: X^2 = 23.5 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.2.12. Inspection of the fixed effects for the model including the mobility measure in did not indicate any differences between the mobility groups.

Summary

The analysis indicates that differences exist between pre-school mobility group and the KS1 mobility group in terms of both 'Self-regulation' and 'Pro-social' behaviour at the end of KS1, with the pre-school mobility group having the greater scores. Equivalent differences were not found in social/behavioural outcomes at entry to Reception.

Social/behavioural Outcomes: KS2

The social/behavioural outcomes for KS2 were examined for any influence of mobility, initially in terms of descriptive statistics and latterly the application of multilevel models, initially a model excluding mobility but including all demographic items and the HLE found to be significant predictors of the given social/behavioural construct (Sammons et al., 2004) along with the identically named corresponding KS1 social/behavioural constructs.

Descriptive statistics for the KS2 social/behavioural scores by mobility group are presented in Table 32. The means also appear in Figures 8.1 to 8.4.

Table 32: Frequency and Mean Year 2 social/behavioural score by mobility

Outcome	Mobility	N	%	Mean	Std. Deviation
'Self-regulation'	**Mobility**	466	22	2.27	0.47
	Non-mobility	1645	78	2.38	0.47
	Total	**2114**	**100**	**-**	**-**
'Pro-social' behaviour	**Mobility**	468	22	2.41	0.51
	Non-mobility	1645	78	2.51	0.45
	Total	**2116**	**100**	**-**	**-**
'Hyperactivity'	**Mobility**	468	22	1.69	0.43
	Non-mobility	1647	78	1.77	0.47
	Total	**2115**	**100**	-	-
'Anti-social' behaviour	**Mobility**	467	22	1.17	0.36
	Non-mobility	1641	78	1.11	0.26
	Total	**2108**	**100**	-	-

Analysis for each construct involved the construction of two models, a basic demographic model accounting for the given KS2 social/behavioural outcome, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the given outcome.

Figure 8.1: Mean KS2 'Self-regulation' scores by mobility group

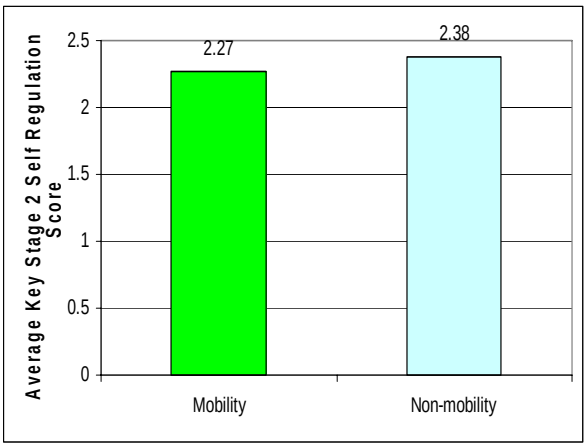


Figure 8.2: Mean KS2 'Pro-social' behaviour scores by mobility group

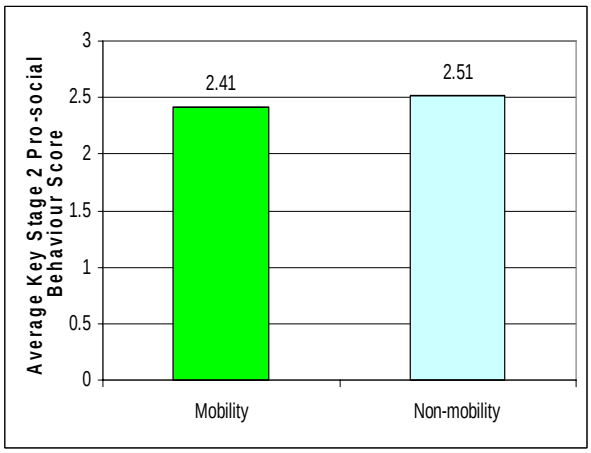


Figure 8.3: Mean KS2 'Hyperactivity' scores by mobility group

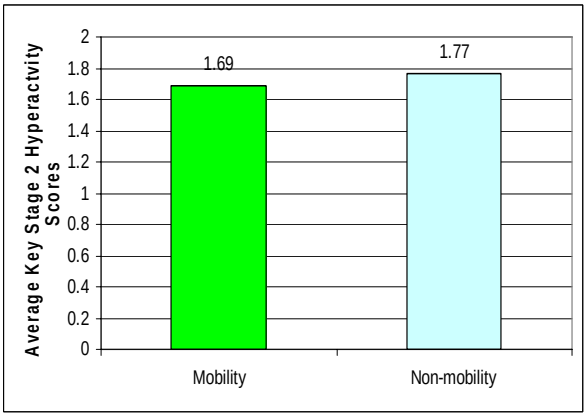
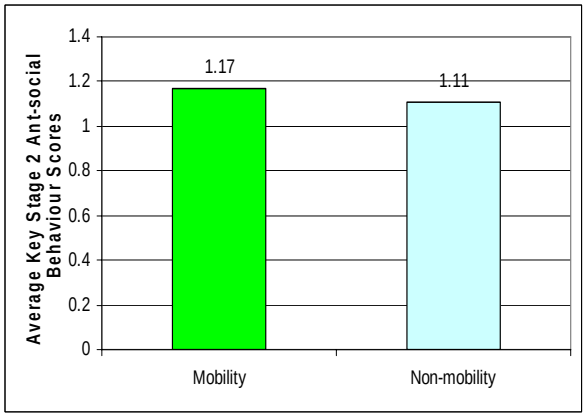


Figure 8.4: Mean KS2 'Anti-social' behaviour scores by mobility group



Analysis for the four social/behavioural outcomes measured at KS2 involved the construction of two models, a basic demographic model, and a subsequent model incorporating the mobility measure, designed to ascertain the independent impact of mobility on the outcome measures. The tables with the prefix 'E' referred to in the remainder of this section all appear in Appendix E.

a) 'Self-regulation'

The Results for 'Self-regulation' indicated that inclusion of the KS2 mobility measure significantly improved the model's fit: X^2 = 3.98 (*d.f.* 1), $p > 0.05$. The properties of the models are shown in Table E.3.1. However, inspection of the fixed effects for the model including the mobility measure indicated the non-mobility group recorded significantly higher 'Self-regulation' scores than the mobility group, ES=0.19 (See Table E.3.2).

b) 'Pro-social' behaviour

The results indicated that the inclusion of the KS2 mobility measure did not significantly improve the model's fit: X^2 = -0.02 (*d.f.* 1), $p > 0.05$. The properties of the models are shown in Table E.3.3. Inspection of the fixed effects for the model including the mobility measure indicated the mobility group recorded significantly lower 'Pro-social' behaviour scores than the non-mobility group ES=0.14 (See Table E.3.4).

c) 'Hyperactivity'

In the case of 'Hyperactivity' the inclusion of the mobility measure did not improve the model's fit: X^2 = 0.78 (*d.f.* 1), $p > 0.05$. The properties of the models are shown in Table E.3.5. Inspection of the fixed effects for the model including the mobility measure indicated the mobility group

recorded significantly higher 'Hyperactivity' scores than the non-mobility group ES=0.13 (See Table E.3.6).

d) 'Anti-social' behaviour

The inclusion of the mobility measure did not significantly improve the model's fit: X^2 = 2.54 (*d.f.* 1), p > 0.05. The properties of the models are shown in Table E.3.7. Inspection of the fixed effects for the model including the mobility measure indicated the mobility group recorded significantly higher 'Anti-social' behaviour scores than the non-mobility group (ES=0.17) (See Table E.3.8).

Summary: KS2 social/behavioural outcomes

Table 33 presents the significant predictors of for the fur KS2 social/behavioural outcomes. KS2 mobility proved significant in the case of 'Self-regulation' and 'Pro-social' behaviour, with lower scores (worse behaviour) associated with mobility.

Table 33: Significant Predictors for KS2 social/behavioural outcomes

Reference Group	'Self-regulation'	'Pro-social' behaviour	'Hyperactivity'	'Anti-social' behaviour
Age at test				
Gender	*	*	*	
'Self-regulation' Year 2	*			
'Pro-social' behaviour Year 2	–	*		
'Hyperactivity' Year 2			*	
'Anti-social' behaviour Year 2				*
Ethnicity		*		*
Birth weight	*			
Development Problems				
Behavioural Problems			*	
English as an additional language (EAL)			*	
Eligibility for Free School Meals (FSM)				*
Family socio-economic status (SES)				*
Salary		*	*	
Mother's Qualifications		*	*	
Father's Qualifications			*	
Mother's Marital status				
Early Years Home Learning Environment (HLE) Index				
KS2 Mobility	*	*	*	*

* $p < .05$; – measure not used in model

Further analyses of social/behavioural outcomes and mobility during Pre-school and KS2

Further analysis involved dividing the sample into four groups covering the period from pre-school to the end of KS2:

1. no school move;
2. pre-school move only;
3. KS2 move only; and
4. move on both occasions.

These divisions are introduced because mobility during KS2 is associated with lower levels of cognitive progress, and the following analysis is applied in order to establish whether any such possible differences are accompanied by differences in social/behavioural development.

Table 34: Descriptive statistics for social/behavioural measures four mobility groups at KS2

Outcome	Mobility Group	N	%	Mean	Std. Deviation
'Self-regulation'	**Non-Mobility**	1116	53	2.36	0.47
	Pre-school Mobility	529	25	2.44	0.45
	Pre-school & KS2 Mobility	184	9	2.31	0.48
	KS2 Mobility	282	13	2.25	0.46
	Total	**2111**	**100**	-	-
'Pro-social' behaviour	**Non-Mobility**	1116	53	2.50	0.46
	Pre-school Mobility	529	25	2.55	0.45
	Pre-school & KS2 Mobility	185	9	2.41	0.50
	KS2 Mobility	283	13	2.41	0.51
	Total	**2113**	**100**	-	-
'Hyperactivity	**Non-Mobility**	1120	53	1.71	0.43
	Pre-school Mobility	527	25	1.64	0.42
	Pre-school & KS2 Mobility	185	9	1.73	0.46
	KS2 Mobility	283	13	1.79	0.48
	Total	**2115**	**100**	-	-
'Anti-social' behaviour	**Non-Mobility**	1114	53	1.12	0.27
	Pre-school Mobility	527	25	1.09	0.24
	Pre-school & KS2 Mobility	185	9	1.17	1.17
	KS2 Mobility	282	13	1.86	1.86
	Total	**2108**	**100**	-	-

The means for the social/behavioural measures appear in the following Figures 8.5 to 8.8.

Figure 8.5: Mean KS2 'Self-regulation' scores by mobility group

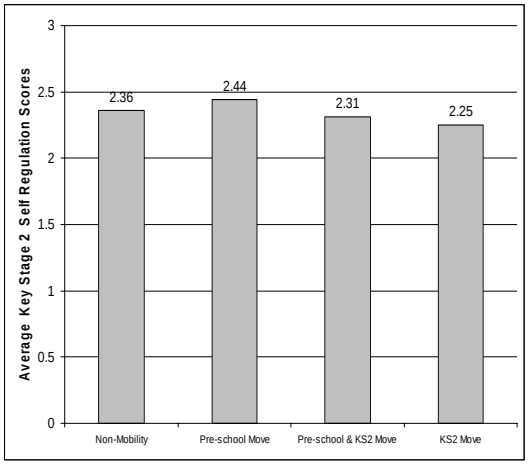


Figure 8.6: Mean KS2 'Pro-social' behaviour by mobility group

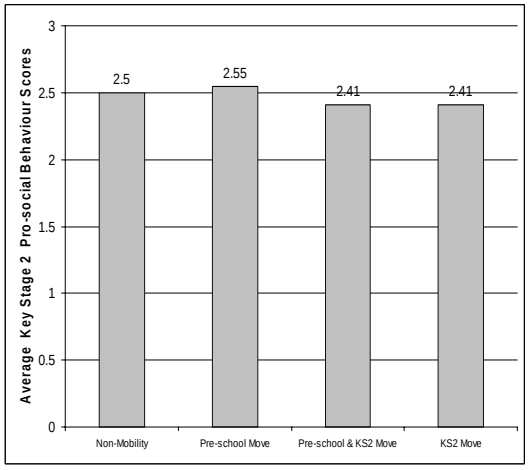


Figure 8.7: Mean KS2 'Hyperactivity' scores by mobility group

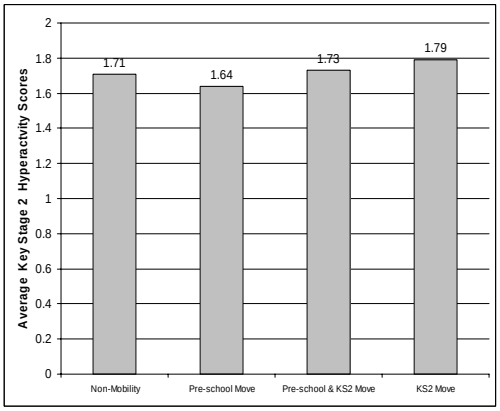
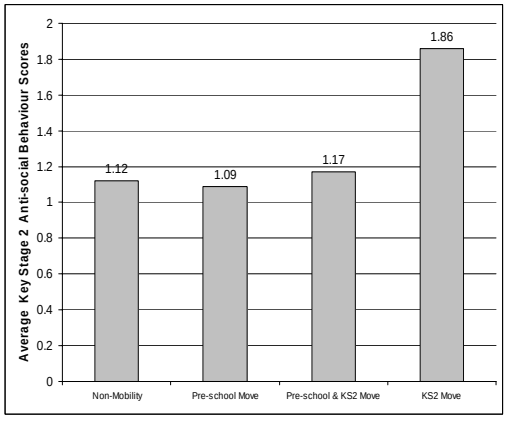


Figure 8.8: Mean KS2 'Anti-social' behaviour scores by mobility group



The mobility models detailed in the preceding section were replicated exactly for each of the four social/behavioural outcomes with the exception that the mobile/non-mobile distinction was replaced with the four group mobility split specified above.

a) 'Self-regulation'

The Results for 'Self-regulation' indicated that inclusion of the KS2 mobility measure did not significantly improve the model's fit: $X^2 = 4.88$ (*d.f.* 3), $p > 0.05$. The properties of the models are shown in Table E.3.9. Inspection of the fixed effects for the model indicated the difference was between the pre-school mobility group, that had the higher scores, and both the KS2 mobility group, (ES=0.23), and the pre-school and KS2 mobility group (ES=0.25).

b) 'Pro-social' behaviour

The results indicated that the inclusion of the KS2 mobility measure significantly improved the model's fit: $X^2 = 9.26$ (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.3.10. Inspection of the fixed effects for the model, however, did indicate a significant difference was between the pre-school mobility group, that had the higher scores, and the KS2 mobility group (ES=0.17), and the pre-school and KS2 mobility group (ES=0.20).

c) 'Hyperactivity'

In the case of 'Hyperactivity' the inclusion of the mobility significantly improved the model's fit: $X^2 = 9.46$ (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.3.11. Inspection of the fixed effects for the model including the mobility measure did not indicate any differences between the mobility groups.

d) 'Anti-social' behaviour

The inclusion of the mobility measure significantly improved the model's fit: X^2 = 10.14 (*d.f.* 3), $p < 0.05$. The properties of the models are shown in Table E.3.12. Inspection of the fixed effects for the model, however, did indicate a significant difference between the pre-school mobility group, that had the lower scores, and the KS2 mobility group (ES=0.16).

Summary

The analysis indicates that differences exist between the pre-school mobility group and the KS2 mobility group in terms of 'Self-regulation', 'Pro-social' behaviour, and 'Anti-social' behaviour, with the pre-school mobility group having more positive scores in each case. Equivalent differences were not found in social/behavioural outcomes at Reception. The pre-school mobility group also had higher scores than the most mobile group – pre-school and KS2 mobility – in both 'Self-regulation' and 'Pro-social' behaviour.

Further analyses of social/behavioural outcomes and mobility during KS1 and KS2

Further analysis involved dividing the sample into four groups covering the period from pre-school to the end of KS2:

5. no school move;
6. KS1move only;
7. KS2 move only; and
8. KS1 and KS2 move.

These divisions are introduced because mobility during KS2 is associated with lower levels of cognitive progress, and the following analysis is applied in order to establish whether any such possible differences are accompanied by differences in social/behavioural development.

Table 34b: Descriptive statistics for social/behavioural measures four mobility groups at KS2

Outcome	Mobility Group	N	%	Mean	Std. Deviation
'Self-regulation'	**Non-Mobility**	1451	68.7	2.40	0.46
	KS1 Mobility	194	9.2	2.29	0.50
	KS2 Mobility	381	18.04	2.30	0.46
	KS1 and KS2 Mobility	85	4.01	2.16	0.49
	Total	**2111**	**100**	-	-
'Pro-social' behaviour	**Non-Mobility**	1452	68.7	2.50	0.45
	KS1 Mobility	193	9.2	2.40	0.50
	KS2 Mobility	383	18.04	2.44	0.50
	KS1 and KS2 Mobility	85	4.01	2.30	0.50
	Total	**2113**	**100**	-	-
'Hyperactivity'	**Non-Mobility**	1452	68.7	1.55	0.41
	KS1 Mobility	195	9.2	1.66	0.47
	KS2 Mobility	383	18.04	1.63	0.45
	KS1 and KS2 Mobility	85	4.01	1.79	0.50
	Total	**2115**	**100**	-	-
'Anti-social' behaviour	**Non-Mobility**	1447	68.7	1.08	0.27
	KS1 Mobility	194	9.2	1.13	0.28
	KS2 Mobility	382	18.04	1.15	0.28
	KS1 and KS2 Mobility	85	4.01	1.25	0.34
	Total	**2106**	**100**	-	-

The means for the social/behavioural measures appear in the following Figures 8.9 to 8.12.

Figure 8.9: Mean KS2 'Self-regulation' scores by mobility group

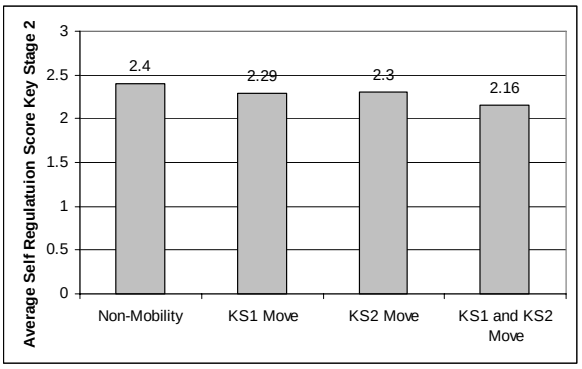


Figure 8.10: Mean KS2 'Pro-social' behaviour by mobility group

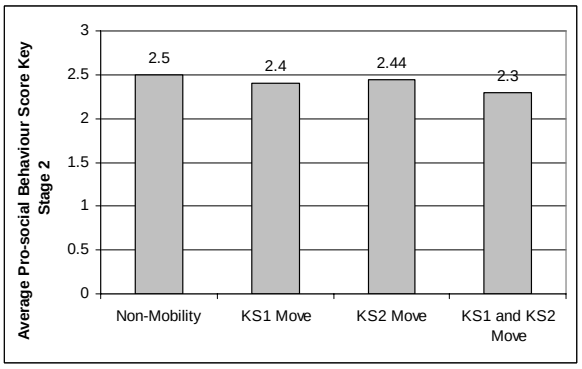


Figure 8.11: Mean KS2 'Hyperactivity' scores by mobility group

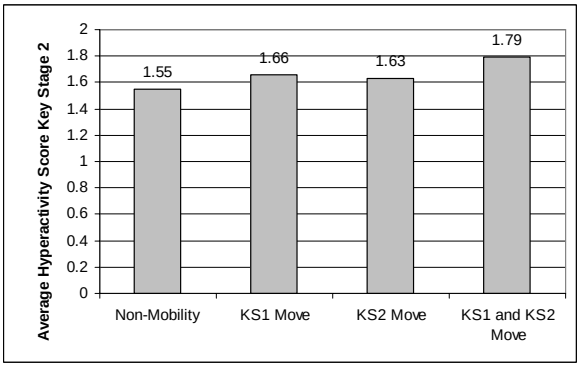
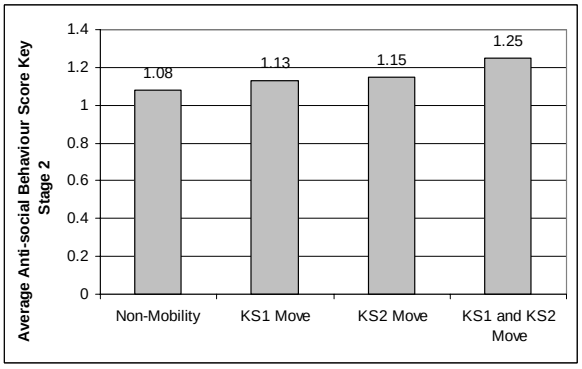


Figure 8.12: Mean KS2 'Anti-social' behaviour scores by mobility group



The mobility models detailed in the preceding section were replicated exactly for each of the four social/behavioural outcomes with the exception that the mobile/non-mobile distinction was replaced with the four group mobility split specified above.

a) 'Self-regulation'

The Results for 'Self-regulation' indicated that inclusion of the KS2 mobility measure did not significantly improve the model's fit: X^2 = 2.92 (*d.f.* 3), $p > 0.05$. The properties of the models are shown in Table E.3.13. Inspection of the fixed effects for the model indicated the differences were between the non-mobility group, which had the higher scores, and both the KS2 only mobility group, (ES=0.19), and the KS1 and KS2 mobility group (ES=0.28).

b) 'Pro-social' behaviour

The results indicated that the inclusion of the KS2 mobility measure did not significantly improve the model's fit: X^2 = 2.84(*d.f.* 3), $p > 0.05$. The properties of the models are shown in Table E.3.14. Inspection of the fixed effects for the model indicated the differences were between the non-mobility group, which had the higher scores, and both the KS2 only mobility group, (ES=0.13), and the KS1 and KS2 mobility group (ES=0.35).

c) 'Hyperactivity'

In the case of 'Hyperactivity' the inclusion of the mobility did not significantly improve the model's fit: X^2 = 5.1 (*d.f.* 3), $p > 0.05$. The properties of the models are shown in Table E.3.15. Inspection of the fixed effects for the model indicated the difference was between the non-mobility group, which had the lower scores, and the KS1 and KS2 mobility group (ES=0.32).

d) 'Anti-social' behaviour

The inclusion of the mobility measure did not significantly improve the model's fit: $X^2 = 0.14$ (*d.f.* 3), $p > 0.05$. The properties of the models are shown in Table E.3.16. Inspection of the fixed effects for the model indicated the differences were between the non-mobility group, which had the lower scores, and both the KS2 only mobility group, (ES=0.12), and the KS1 and KS2 mobility group (ES=0.48).

Summary

The analysis indicates that differences exist between the non- mobility group and the KS2 mobility groups in terms of 'Self-regulation', 'Pro-social' behaviour, 'Hyperactivity' and 'Anti-social' behaviour, with the non-mobility group having more positive scores in each case.

Primary School Academic Effectiveness Ratings

This section explores the Effectiveness ratings for each school EPPE 3-11 children attended. Melhuish et al., (2006) gives further details.

These ratings are averaged over the period 2002-2004 and the scores for English, Mathematics and Science combined to produce a single value. These have been matched with the schools in the present sample for each initial KS1 school per EPPE 3-11 child, and then for the first school each individual in the Mobility group attended after they moved. The higher the ratings the better the school's academic performance.

The following analysis is intended to establish whether those EPPE 3-11 children who moved were at less effective schools before they moved, compared to the remainder of the sample, and whether the move resulted in EPPE 3-11 children attending a school with improved effectiveness ratings. Additionally the IMD scores for EPPE 3-11 families' initial home address are compared by mobility group to determine if there is any further evidence of social disadvantage associated with any particular group.

Key Stage 1

KS1: Initial Schools' Effectiveness ratings

Table 35 shows the mean effectiveness ratings (where such data was available) for the Non-mobility and mobility groups' initial KS1 Schools.

Table 35: Mean Effectiveness ratings for mobility groups' Initial KS1 Schools (N = 1917)

Group	N	Mean Effectiveness rating	s.d.	S.E.
Non-mobility	1093	-0.11	0.63	0.02
Pre-school Mobility	505	0.01	0.67	0.03
KS1 Mobility	224	-0.13	0.70	0.05
Pre-school & KS1 Mobility	95	-0.03	0.79	0.08

Analysis of the data indicated a significant difference in the effectiveness ratings between at least two of the groups: $F = 4.48$ (*d.f.* 3, 1913), $p < .05$. Post hoc tests indicated the difference was between the Pre-school mobility group and both the Non-mobility group and the KS1 Mobility group, with the Pre-school mobility group recording significantly higher average school academic effectiveness ratings than either of the other groups.

KS1: Mobile Group's First and Second Schools

Further analysis was conducted to investigate whether moving schools led to an associated change in the mobility groups' schools' average academic effectiveness ratings, the figures for which appear in Table 36. These data need to be treated with some caution: due to deficiencies in the data set not all individuals have academic effectiveness ratings at both time points; hence there are differences in the reported numbers mean effectiveness ratings in Tables 35 and 36.

Table 36: Mean Effectiveness ratings for mobility groups' Initial and Second KS1 Schools

School	N	Mean Effectiveness rating	s.d.	S.E.
KS1 Mobility First School	155	-0.18	0.67	0.05
KS1 Mobility Second School	155	0.04	0.57	0.05
Pre-school & KS1 Mobility First School	66	-0.03	0.78	0.09
Pre-school & KS1 Mobility Second School	66	-0.08	0.60	0.07

The analysis indicated a significant difference between the two sets of ratings but only for the KS1 Mobility groups, with the average academic effectiveness ratings for the second school greater than those for the first: t = -2.26 (*d.f.* 154), p < .05.

Additional analysis was conducted to investigate whether the Index of Multiple Deprivation (IMD) scores for pre-school home address were different for each of the mobility groups:

Table 37: Mean IMD ratings by Mobility Group

Group	N	Mean IMD Score	s.d.	S.E.
Non-mobility	1566	28.67	19.04	0.50
Pre-school Mobility	726	28.52	17.58	0.65
KS1 Mobility	299	34.78	20.13	1.16
Pre-school & KS1 Mobility	150	31.67	18.91	1.54

Analysis of the data indicated a significant difference between at least two sets of ratings (F = 10.26; *d.f.* 3, 2737, p < .05). Post hoc tests indicated the difference was between the KS1 Mobility group and both the Pre-school mobility group and non-mobility group, with the KS1 mobility group recording significantly greater IMD ratings than either of the other groups.

Summary KS1 School Effectiveness ratings

The Pre-school mobility group attended primary schools that had higher average academic effectiveness ratings than either the non-mobility group or the KS1 mobility group. However, it is interesting to find that the KS1 mobility group did appear to improve their academic effectiveness ratings by moving to a second school.

The results for IMD scores were consistent with the initial finding: the KS1 mobility group had greater IMD scores and therefore were resident in areas of greater deprivation than the Pre-school mobility group.

Key Stage 2

KS2: Initial Schools' Effectiveness ratings

Table 38 shows the mean Effectiveness ratings (where such data was available) for the Non-mobility and mobility groups' initial KS2 Schools.

Table 38: Mean Effectiveness ratings for the mobility groups' Initial KS2 Schools (N = 2169)

Group	N	Mean Effectiveness Rating	s.d.	S.E.
Non-mobility	1189	-0.13	0.64	0.02
Pre-school Mobility	500	-0.06	0.66	0.03
KS2 Mobility	307	-0.11	0.63	0.04
Pre-school & KS2 Mobility	173	0.25	0.66	0.05

Analysis of the data indicated a significant difference in the effectiveness ratings between at least two of the groups, (F = 3.63; *d.f.* 3, 2165, p < .05). Post hoc tests indicated the difference was between the non-mobility group and the pre-school and KS2 mobility group, with the latter group recording significantly higher average school academic effectiveness ratings than the former.

KS2: Mobile groups' First and Second Schools

Further analysis was conducted to investigate whether moving schools led to an associated change in the mobility groups' schools' average academic effectiveness ratings, the figures for which appear in Table 39. These data need to be treated with some caution: due to deficiencies in the data set not all individuals have academic effectiveness ratings at both time points; hence there are differences in the reported numbers for the mean Effectiveness ratings in Tables 38 and 39.

Table 39: Mean Effectiveness ratings for the mobility groups' First and Second KS2 Schools

School	N	Mean Effectiveness Rating	s.d.	S.E.
KS2 Mobility First School	239	-0.09	0.60	0.04
KS2 Mobility Second School	239	-0.13	0.62	0.04
Pre-school & KS2 Mobility First School	131	0.03	0.70	0.06
Pre-school & KS2 Mobility Second School	131	-0.07	0.72	0.06

The analysis did not indicate any significant difference between the two sets of ratings for either group.

Additional analysis was conducted to investigate whether the Index of Multiple Deprivation (IMD) scores for pre-school home address were different for each of the mobility groups:

Table 40: Mean IMD ratings by mobility group

Group	N	Mean IMD Score	s.d.	S.E.
Non-mobility	1413	28.87	19.20	0.51
Pre-school Mobility	635	28.23	18.35	0.73
KS2 Mobility	368	31.42	19.35	1.01
Pre-school & KS2 Mobility	223	30.62	16.23	1.54

Analysis of the data indicated a significant difference between at least two sets of ratings, (F = 2.83; *d.f.* 3, 2635, p < .05). Post hoc tests indicated the difference was between the KS2 Mobility group and both the Pre-school mobility group, and non-mobility group, with the KS2 mobility group recording the significantly higher IMD ratings.

Summary KS2 School Effectiveness Ratings

The Pre-school and KS2 mobility group attended primary schools that had higher average academic effectiveness ratings than the Non-mobility group. This is probably due to the inclusion of elements of the pre-school mobility group, who tended to select primary schools with a higher effectiveness rating. A change of schools during KS2 did not result in the EPPE 3-11 child attending a school with a significantly different academic effectiveness rating.

Interestingly the analysis of the IMD scores indicated or underlined the greater degree of social advantage – measured in terms of lower IMD ratings - enjoyed by the (just) Pre-school mobility group compared to a group just mobile during primary school, in this case KS2.

Section 9: Discussion

Tracking

The EPPE 3-11 project recruited children from 141 pre-school settings in six English Local Authorities (LAs) at the age of 3+. The project then followed these children through their primary school careers until the end of KS2 in primary school (Year 6, age 11). By this point the EPPE 3-11 children were attending over 800 primary schools in over 100 English LAs. Tracking the EPPE 3-11 sample has been an on-going process which has not just taken place at the key points of transfer for children. Our experience during the pre-school and primary years has shown that our sample is a very mobile one.

The EPPE 3-11 research demands regular monitoring of children's cognitive and social/behavioural development at key time points. Assessments have been conducted at various time points to enable the team to plot individual learner 'trajectories' for all of the children in the study. During the last 10 years EPPE 3-11 researches have successfully 'tracked' the whereabouts of the EPPE 3-11 sample ensuring that assessments are conducted at particular time points. Keeping track of the sample ('tracking') is an essential part of any longitudinal study. Compared to other similar studies (e.g. ALSPAC, The Millennium Cohort Study), EPPE 3-11 has been very successful in 'tracking' the sample. Successful 'tracking' of the EPPE 3-11 sample has also allowed the project to keep in regular contact with the EPPE 3-11 children and their parents as well as key school personnel. This has ensured low attrition and high response rates from the children, families and schools in our study. The EPPE 3-11 findings have been used to inform policy at a number of levels; practitioner, Local authority and nationally.

The EPPE 3-11 project has a number of recommendations based on the experience of tracking a longitudinal sample of 3000 children for the last 10 years. These recommendations include, that resources for tracking a longitudinal sample need to be built into research grants from the outset, that multiple sources are needed for tracking a longitudinal sample (i.e. families, family friends, schools, other agencies), that regular contact needs to be established with all sources in order to keep up to date with changes and therefore successfully track a longitudinal sample. In addition, EPPE 3-11 suggests that thorough tracking processes need to be established and followed in order to retain a longitudinal sample. Successful tracking of a longitudinal sample enables communication with the research participants and other agencies, this assists the study by helping participants to remain committed to and feel a valued part of the research.

The successful tracking of the EPPE 3-11 sample has enabled this 10 year longitudinal study to ascertain the whereabouts of the sample, maintain good relationships with families and schools, and promote excellent response rates. In addition, it has enabled us to expand our work in looking at the effects of mobility on children's cognitive attainment and progress and social/behavioural development.

Mobility

The findings of the present research, in terms of mobility itself, are broadly consistent with previous research (Strand and Demie, 2006). Mobility, that is at least one change of school, either during pre-school or KS1 has little independent impact on cognitive outcomes, when both background and prior attainment are taken into account and when the estimate is made against a simple non-mobility group for the same period.

Furthermore, the results of the multilevel analysis, in the present research, over the pre-school period indicate that mobility itself, moving pre-school centre is not a significant predictor of poorer academic progress, however such an effect might be realised, simply because it has no such detectable impact during pre-school. That is, for this sample, mobility does not empirically produce diminished or increased academic progress during the pre-school years. However, there is evidence that mobility is associated with diminished social/behavioural outcomes, specifically

'Self-regulation' and 'Pro-social' behaviour at older ages. While these diminished outcomes are associated with KS1 primary school mobility, it is not clear whether this is a causal relationship or whether mobility reflects family characteristics that are unmeasured in the current study, but that might mediate the association between mobility and social/behavioural outcomes. Possible unmeasured family characteristics that might be influential include parental personality such as being 'go-getting' or achievement oriented or sub-cultural factors related to child achievement, movement might be job related, or due to family break down, or increase in family size for example (Ofsted, 2002).

Pre-school mobility, which is far more prevalent than KS1 mobility, is characterised by social advantage – particularly mother's highest academic qualification level: the greater the level of such advantage the more likely a child is to move. Conversely, non-mobility during pre-school is likely to be characterised by social disadvantage, specifically in terms of eligibility for free school meals. Sammons et al., (2004), found that eligibility for FSM was associated with poorer academic attainment at age 7 for both Reading and Mathematics. Given the prevalence of those eligible for FSM amongst those engaged in KS1 mobility there is then the possibility that such EPPE 3-11 children are more likely to perform relatively poorly at school. Ofsted (2002) had data that showed a relationship between primary school mobility and known eligibility for free school meals (FSM), but the relationship was less marked than that found in secondary schools.

However, despite differences in socio-economic background between Pre-school and KS1 mobility, and the likely consequences of this for educational performance Pre-school mobility is associated with greater progress only in Total Verbal Ability scores when measured at Reception. This is an effect probably due to greater home learning environment (HLE) levels also enjoyed by this group, as the greater the level of the HLE the greater the EPPE 3-11 child's academic performance (Melhuish et al., 2008). The difference in Total Verbal Ability progress may, though, be an indicator of latent differences between the groups on a wider range of outcomes.

Pre-school mobility is not found to result in any detectable boost or reduction in terms of either Early number concepts or Pre-reading scores, nor in terms of any social/behavioural development when measured at Reception in primary school. However, there is one key difference measured at reception in primary school between the pre-school mobility group and all those non-mobile during pre-school - that being between the primary schools them selves, specifically measured in terms of their academic effectiveness rating.

KS1 mobility was characterized by significantly different child profiles in terms of key background characteristics; marked out by social disadvantage. Simply comparing this group against the non-mobility group during KS1 does not show any evidence of diminished cognitive progress. However, when Pre-school mobility is also factored into the analysis, poorer progress in Mathematics becomes apparent, specifically in comparison with children who had moved only during the pre-school period.

KS1 mobility seems to be associated with the academic effectiveness of the primary school as the second schools attended had higher academic effectiveness ratings, on average, than the first. The relatively poor effectiveness ratings of this groups' first schools is perhaps a reflection of local residential area deprivation levels, as measured in terms of the IMD as Ofsted inspection evidence has suggested that weaker schools are associated with social disadvantage.

The results indicate KS2 mobility is associated with poorer academic progress in mathematics, compared to the non-mobile group during KS2.

Compared with the KS1 mobility group the socio-demographic composition of the KS2 mobility group is more mixed, where children from both the higher and lower ends of the SES scale are more likely to be mobile (as opposed children from the middle). However, children mobile in KS2, as in KS1, tend to be associated with social disadvantage: children with absent fathers are more likely to be mobile during KS2. Also analyses of the IMD scores indicate that the children in the

KS2 mobility group come from more disadvantaged areas (compared to both the pre-school mobility group and a non-mobile group).

Compared with non-mobile children, children mobile during KS2 have poorer social/behavioural development. Poorer social/ behavioural development was also noted during KS1 (for those mobile during KS1) in the case of Self Regulation, Pro-social behaviour; but those mobile during KS2 show poorer development in Self Regulation, Pro-social behaviour, Hyperactivity and Anti-social behaviour.

Furthermore, those mobile in KS1 but not KS2, do not, by the end of KS2, show any significant social/ behavioural deficit compared to the non-mobility group. Therefore the deleterious effects associated with mobility are not apparent for those children who remain stationary during KS2. However, this is not the case if the child is mobile during KS2 as well: these show the poorest levels of social/ behavioural development.

The results indicated that both the KS1 and KS2 mobility groups were likely to be resident in areas with greater levels of economic/social deprivation than the Pre-school mobility group. The consequence of this is that there is likely to be a slight, but nonetheless detectable, influence of 'neighbourhood' on academic performance, with greater environmental deprivation being associated with lower levels of academic attainment (Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov, 1997).

Most children initially attend their nearest schools unless parents are able to exercise successfully the choice to attend another school (something more advantaged parents may be more likely to attempt). Thus, the KS1 and KS2 mobility groups may have had access to less academically effective local primary schools. The consequence of this seems to be a negative impact on academic progress in Mathematics by KS2 and poorer levels of social/behavioural development. Elsewhere we have shown that the academic effectiveness of the primary school influences EPPE 3-11 children's academic progress during KS2 in both Reading and Mathematics, although the influence is stronger for Mathematics.

The difference in Mathematics progress (given socio-economic background and HLE were controlled for) between the KS1 mobility group and the Pre-school mobility group can be attributed to differences in the schools the EPPE 3-11 children attended as such differences in progress were not apparent at Reception. KS1 mobility may possibly be seen as an attempt to address the consequences of attending a low academically effective school by parents moving their children to a more effective school, although in the absence of any data from parents about the reasons for a move this hypothesis can only be seen as speculative. Characterising KS1 mobility as a possible response to an EPPE 3-11 child's poor progress and / or development is consistent with the findings of Machin, Telhaj and Wilson (2006). Ofsted (2002) suggests that differences in the relationship between mobility and attainment may also reflect differences between schools in their ability to manage mobility effectively.

It may be, at least in some cases, that mobility is a strategy: the objectives of pre-school and KS1 mobility are identical – locating the EPPE 3-11 child at a more academically effective primary school. The difference between the two is that pre-school mobility may be viewed as pre-emptive or pro-active whereas later mobility may be viewed as reactive. That the primary schools' academic effectiveness ratings were found to be non-randomly distributed among the mobility groups supports such a hypothesis.

KS2 mobility though seems to be more closely associated with social/behavioural development: moving schools during KS2 may then be a consequence of poor social/behavioural development, poor development which itself impacts on academic progress. That is, mobility is a *response* to a set of deficiencies rather than a source of academic under achievement. However, KS2 mobility does not result in the child being located at a more academically effective school, rather at just another school, KS2 mobility might be characterised as aiming to simply change the pupil's educational environment, but not to any particular environment.

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Appendix 1: EPPE 3-11 Cohort Grid

	Date of birth	Entry to study (age 3+)	Entry to Reception (age 5)	Year 1 (age 6)	Year 2 (age 7)	Year 3 (age 8)	Year 4 (age 9)	Year 5 (age 10)	Year 6 (age 11)	Year 7 (age 12)	Year 8 (age 13)	Year 9 (age 14)	Year 10 (age 15)	Year 11 (age 16)
Cohort 1	Sept 92 – Aug 93	**Sept 95 – Aug 96**	**Sept 97 – Aug 98**	**Sept 98 – Aug 99**	**Sept 99 – Aug 00**	Sept 00 – Aug 01	Sept 01 – Aug 02	**Sept 02 – Aug 03**	**Sept 03 – Aug 04**	Sept 04 – Aug 05	Sept 05 – Aug 06	**Sept 06 – Aug 07**	**Sept 07 – Aug 08**	**Sept 08 – Aug 09**
Cohort 2	Sept 93 – Aug 94	**Sept 96 – Aug 97**	**Sept 98 – Aug 99**	**Sept 99 – Aug 00**	**Sept 00 – Aug 01**	Sept 01 – Aug 02	Sept 02 – Aug 03	**Sept 03 – Aug 04**	**Sept 04 – Aug 05**	Sept 05 – Aug 06	**Sept 06 – Aug 07**	**Sept 07 – Aug 08**	**Sept 08 – Aug 09**	**Sept 09 – Aug 10**
Cohort 3	Sept 94 – Aug 95	**Sept 97 – Aug 98**	**Sept 99 – Aug 00**	**Sept 00 – Aug 01**	**Sept 01 – Aug 02**	Sept 02 – Aug 03	Sept 03 – Aug 04	**Sept 04 – Aug 05**	**Sept 05 – Aug 06**	**Sept 06 – Aug 07**	**Sept 07 – Aug 08**	**Sept 08 – Aug 09**	**Sept 09 – Aug 10**	**Sept 10 – Aug 11**
Cohort 4	Sept 95 – Aug 96	**Sept 98 – Aug 99**	**Sept 00 – Aug 01**	**Sept 01 – Aug 02**	**Sept 02 – Aug 03**	Sept 03 – Aug 04	Sept 04 – Aug 05	**Sept 05 – Aug 06**	**Sept 06 – Aug 07**	**Sept 07 – Aug 08**	**Sept 08 – Aug 09**	**Sept 09 – Aug 10**	Sept 10 – Aug 11	**Sept 11 – Aug 12**

Key

Cohort Year Groups

- **Academic Year 2006-2007**
- **Academic Year 2007-2008**
- **Academic Year 2008-2009**
- **Academic Year 2009-2010**

Key Stage (KS) Assessment time points

- **KS1 SATs Assessments (Year 2, age 7)**
- **KS2 SATs Assessments (Year 6, age 11)**
- **KS3 SATs Assessments (Year 9, age 14)**
- **KS4 GCSEs (Year 11, age 16)**

EPPE 3-11 Standardised Cognitive Assessment time points

- **Pre-school Assessments (age 3-4)**
- **Reception Assessments (age 5)**
- **Year 1 Assessments (age 6)**
- **Year 5 Assessments (age 10)**

A social/behavioural assessment is completed for EPPE 3-11 children at each of the highlighted time points. Please see below for further information about the assessments used in the EPPE 3-11 project.

Appendix 1 continued: EPPE 3-11 Assessment points

The EPPE 3-11 sample was assessed at key time points during the study.

Table A1: EPPE 3-11 Assessment points

	Entry to the EPPE Study (Pre-School)	Entry to Reception	Year 1	Year 2	Year 5	Year 6
Age	3 to 4 years	Rising 5 years	6 years old	7 years old	10 years old	11 years old
Cognitive Assessment	Standardised Assessments: -British Ability Scales (BAS)	Standardised Assessments: -British Ability Scales (BAS) -Letter Recognition -Phonological Awareness (Pre-reading)	Standardised Assessments: -Primary Reading Standardised score (Level 1/NFER-Nelson) -Maths 6 Standardised score (Level 1/NFER-Nelson)	National Assessments: -English (Reading, Writing) -Mathematics	Standardised Assessments: -Primary Reading Standardised score (Level 2/NFER-Nelson) -Maths 10 Standardised score (Level 2/NFER-Nelson)	National Assessments: -English -Mathematics -Science
Social/behavioural Assessment	Child profile completed by Pre-school worker	Child profile completed by Reception teacher	Child profile completed by Year 1 teacher	Child profile completed by Year 2 teacher	Child profile completed by Year 5 teacher	Child profile completed by Year 6 teacher

Appendix 2: EPPE 3-11 Tracking Proforma

Effective Pre-School and Primary Education 3-11 (EPPE 3-11) Project
Tracking Information

Our information is that the following children are enrolled in your school. We would be grateful if you could let us know if any of these children have moved home address or school.

School ID and School Address are written here				
H.T. : Name of Headteacher is written here		Phone No : School phone number is written here		
EPPE ID/ DfES UPN	Name and current address held	New address (and phone no.) of parents (if known)	Address (and phone no.) of new school or LEA (if known)	Date of leaving your school
EPPE 3-11 Child ID is written here	EPPE 3-11 Child's name and contact details (address and phone no.) are written here.			

Thank you for your help. Please return to The EPPE 3-11 Project, Room 416, The Institute of Education, 20 Bedford Way, London WC1H OAL or ring Brenda Taggart on 0207 612 6219 Fax no: 0207 612 6230

Appendix 3: Tracking Database

The purpose of this database is to maintain up-to-date school and parent/carer details so that contact with families and regular feedback in the form of newsletters etc. is possible.

In the last 3 years, significant improvements have been made to the project's Microsoft Access Tracking Database. The database holds records on all children that have been involved in the project, including:

1 name
2 date of birth
3 UPN
4 gender
5 cohort
6 name of their parents
7 families contact details
8 updated dates
9 'second contact' information
10 consent status
11 parental correspondence notes.

In addition, the database also holds school information including:

12 history of the child's mobility
13 current school attended
14 school identification number
15 local authority number
16 start dates
17 end dates
18 school phase and type
19 names of headteachers
20 other members of school staff
21 school correspondence notes.

Appendix A: Details of Selected Measures used in the EPPE Study

A.1: The Multiple Disadvantage Index

The Multiple Disadvantage Index was developed as part of the Early Years Transition & Special Educational Needs (EYTSEN) Project which focuses on the identification of children 'at risk' of SEN) (see Sammons, Taggart, Smees, Sylva, Melhuish, Siraj-Blatchford and Elliot, 2003 for more details). An index was created based on 10 indicators in total: three child variables, six parent variables, and one related to the Early years home learning environment (HLE). All the variables were chosen because they related to low baseline attainment when looked at in isolation. Where indicators were closely related, such as first language and ethnic groups, only the most significant was included.

A.2: Child variables

- First language: English as an additional language (EAL)
- Large family: 3 or more siblings
- Pre-maturity / low birth weight

A.3: Parent variables

- Mother's highest qualification level: no qualifications
- Social class of father's occupation: Semi-skilled, unskilled, never worked, absent father
- Father not employed
- Young Mother (Age 13-17 at birth of EPPE 3-11 child)
- Lone parent
- Mother not working / unemployed
- Low Early years home learning environment (HLE)

A.4: The Key Stage 1 Home Learning Environment (HLE)

HLE Factors and the items loading on these factors:

Home Computing

- The Child plays on computer by themself.
- Respondent plays computer games with the child.
- Respondent uses computer with the child in educational ways.

Parent-Child enrichment outing/activity outside home.

- Respondent visits library with the child.
- Respondent does sport/physical activity with the child.
- Respondent goes on educational visits with the child.

Parent-child one-to-one interactions at home

- Respondent plays with the child using toys/games/puzzles.
- Respondent reads to the child.
- Respondent listens to the child read.

Expressive play

- The Child plays 'make believe' or pretend games.
- The Child paints/draws/makes models.
- The Child enjoys dance music and movement.

Appendix B: Mobility Descriptive Statistics

Table B.1: Mobility by Birth Weight

Mobility	Birth Weight	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	Very Low < 1500g	27	69.2	12	30.8	.31	.47	39
	Low 1501-2000g	141	73.4	51	26.6	.27	.44	192
	Normal 200g+	1709	67.8	812	32.2	.32	.47	2521
	Total	1877	68.2	875	31.8	-		2752
KS1	Very Low < 1500g	31	79.5	8	20.5	.21	.40	39
	Low 1501-2000g	152	152	30	30	.17	.37	182
	Normal 200g+	2045	2045	405	405	.17	.37	2450
	Total	2228	83.4	443	16.6	-	-	2671
KS2	Very Low < 1500g	25	67.6	12	32.4	.3243	.47458	37
	Low 1501-2000g	131	74.0	46	26.0	.2599	.43982	177
	Normal 200g+	1842	78.1	517	21.9	.2192	.41377	2359
	Total	2054	77.5	596	22.5	-	-	2650

Table B.2: Mobility by First Language

Mobility	First Language	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	English	1785	68.1	837	31.9	.31	.47	2622
	English as Additional Language	178	75.7	57	24.3	.24	.42	235
	Total	1963	68.7	894	31.3	-	-	2857
KS1	English	2124	83.4	422	16.6	.17	.37	2546
	English as Additional Language	164	79.2	422	20.8	.21	.41	207
	Total	2288	83.1	465	16.9	-	-	2753
KS2	English	1908	77.4	556	22.6	.2256	.41809	2464
	English as Additional Language	146	78.5	40	21.5	.2151	.41197	186
	Total	2054	77.5	596	22.5	-	-	2650

Table B.3: Mobility by Number of Siblings

Mobility	Number of Siblings	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	None	397	65.8	206	34.2	.34	.47	603
	One	699	66.1	358	33.9	.34	.47	1057
	Two	523	69.5	229	30.5	.30	.47	752
	Three	187	71.4	75	28.6	.29	.45	262
	Four or more	97	86.6	15	13.4	.13	.34	112
	Total	1903	68.3	883	31.7	-	-	2786
KS1	None	484	83	99	17	.17	.38	583
	One	841	82	184	18	.18	.38	1025
	Two	629	85.2	109	14.8	.15	.35	783
	Three	213	85.2	37	14.8	.15	.40	250
	Four or more	88	81.5	20	18.5	.19	.40	108
	Total	2255	83.4	449	16.6	-	-	2704
KS2	None	420	75.7	135	24.3	.2432	.42943	555
	One	791	79.3	207	20.7	.2074	.40566	998
	Two	551	78.2	154	21.8	.2184	.41348	705
	Three	180	74.4	62	25.6	.2562	.43744	242
	Four or more	79	76.0	25	24.0	.2404	.42939	104
	Total	2021	77.6	583	22.4	-	-	2604

Table B.4: Mobility by Development Problems

Mobility	Development Problems	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	None	1666	68.3	775	31.7	.32	.47	2441
	One	218	68.8	99	31.2	.31	.46	317
	Two or more	24	68.6	11	31.4	.31	.47	35
	Total	1908	68.3	885	31.7	-	.31	35
KS1	None	1988	84	380	16	.16	.37	2368
	One	244	79	65	21	.21	.21	309
	Two or more	28	82.4	6	17.6	.18	.18	34
	Total	2260	83.4	451	16.6	-	.17	2711
KS2	None	1777	77.9	505	22.1	.2213	.41521	2282
	One	223	75.6	72	24.4	.2441	.43026	295
	Two or more	25	75.8	8	24.2	.2424	.43519	33
	Total	2025	77.6	585	22.4	-	-	2610

Table B.5: Mobility by Behavioural Problems

Mobility	Behavioural Problems	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	None	1674	68.3	776	31.7	.32	.47	2450
	One	193	67.5	93	32.5	.33	.47	286
	Two or more	41	71.9	16	28.1	.28	.45	57
	Total	1908	68.3	885	31.7	-	-	2793
KS1	None	1999	83.8	386	16.2	.16	.37	2385
	One	215	79.6	55	20.4	.20	.40	270
	Two or more	46	82.1	10	17.9	.18	.39	56
	Total	2260	83.4	451	16.6	-	-	2711
KS2	None	1797	78.2	501	21.8	.2180	.41299	2298
	One	195	75.0	65	25.0	.2500	.43385	260
	Two or more	33	63.5	19	36.5	.3654	.48624	52
	Total	2025	77.6	585	22.4	-	-	2610

Table B.6: Mobility by Health Problems

Mobility	Health Problems	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	None	1250	67.7	597	32.3	.32	.47	1847
	One	484	68.7	221	31.3	.31	.46	705
	Two or more	174	72.2	67	27.8	.28	.45	241
	Total	1908	68.3	885	3.7	-	-	2793
KS1	None	1510	84	287	16	.16	.36	1798
	One	565	82.8	117	17.2	.17	.37	682
	Two or more	185	79.7	47	20.3	.20	.40	232
	Total	2260	83.4	451	16.6	-	-	2711
KS2	None	1345	77.9	381	22.1	.2207	.41487	1726
	One	504	76.1	158	23.9	.2387	.42659	662
	Two or more	176	79.3	46	20.7	.2072	.40622	222
	Total	2025	77.6	585	22.4	-	-	2610

Table B.7: Mobility by Highest socio-economic status (SES)

Mobility	Highest Socio-economic status (SES)	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	Professional non-manual	161	59.2	111	40.8	.41	.49	272
	Other professional non-manual	498	66.6	250	33.4	.33	.47	748
	Skilled non-manual	618	66.8	307	33.2	.33	.47	925
	Skilled manual	260	75.6	84	24.4	.24	.43	344
	Semi-skilled	273	75.6	88	24.4	.24	.42	361
	Unskilled	45	71.4	18	24.4	.29	.45	63
	Never worked	44	64.7	24	35.3	.35	.48	68
	Total	1899	68.3	882	31.7	-	-	2781
KS1	Professional non-manual	220	82.7	46	17.3	.17	.38	266
	Other professional non-manual	616	84.3	115	15.7	.16	.36	731
	Skilled non-manual	771	86	126	14	.16	.35	897
	Skilled manual	285	84.8	51	15.2	.15	.36	336
	Semi-skilled	266	76.9	80	23.1	.23	.42	346
	Unskilled	47	78.3	13	21.7	.22	.42	60
	Never worked	48	75	16	25	.25	.44	64
	Total	2253	100	447	100	-	-	2700
KS2	Professional non-manual	190	74.2	66	25.8	.2578	.43829	256
	Other professional non-manual	550	77.7	158	22.3	.2232	.41666	708
	Skilled non-manual	701	80.3	172	19.7	.1970	.39798	873
	Skilled manual	252	79.2	66	20.8	.2075	.40619	318
	Semi-skilled	252	76.8	76	23.2	.2317	.42257	328
	Unskilled	35	62.5	21	37.5	.3750	.48850	56
	Never worked	37	62.7	22	37.3	.3729	.48772	59
	Total	2054	77.5	596	22.5	-	-	2650

Table B.8: Mobility by Family Salary

Mobility	Annual Family Salary	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	No salary	336	71.3	135	28.7	.29	.45	471
	£ 2,500 – 17,499	304	71.4	122	28.6	.29	.45	426
	£ 17,500 – 29,999	254	64.8	138	35.2	.35	.48	392
	£ 30,000 – 37,499	170	65.6	89	34.4	.34	.48	259
	£ 37,500 – 67,499	274	59.8	184	40.2	.40	.48	458
	£ 67,500 – 132,000+	83	48.3	89	40.2	.51	.47	172
	Total	1421	65.2	757	34.8	-	-	2178
KS1	No salary	386	82	85	18	.18	.38	471
	£ 2,500 – 17,499	363	85.4	62	14.6	.15	.35	425
	£ 17,500 – 29,999	347	88.5	45	11.5	.11	.32	392
	£ 30,000 – 37,499	228	88	31	12	.12	.33	259
	£ 37,500 – 67,499	399	87.1	59	12.9	.13	.34	458
	£ 67,500 – 132,000+	148	148	24	14	.14	.35	172
	Total	1871	85.9	306	14.1	-	-	2177
KS2	No salary	352	75.5	114	24.5	.2446	.43033	466
	£ 2,500 – 17,499	328	78.3	91	21.7	.2172	.41282	419
	£ 17,500 – 29,999	328	84.1	62	15.9	.1590	.36612	390
	£ 30,000 – 37,499	206	79.5	53	20.5	.2046	.40421	259
	£ 37,500 – 67,499	360	79.1	95	20.9	.2088	.40689	455
	£ 67,500 – 132,000+	130	76.0	41	24.0	.2398	.42819	171
	Total	2054	77.5	596	22.5	-	-	2650

Table B.9: Mobility by Mother's Highest Qualification

Mobility	Mother's Highest Qualification	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	None	386	77	115	23	.23	.42	501
	Vocational	283	66.9	140	33.1	.33	.47	423
	16 academic	752	71.8	296	28.2	.28	.45	1048
	18 academic	159	64.1	89	35.9	.36	.48	248
	Degree or equivalent	212	56.7	162	43.3	.43	.50	374
	Higher degree	72	55.8	57	44.2	.44	.50	129
	Other professional/misc	22	51.2	21	48.8	.49	.47	43
	Total	1886	68.2	880	31.8	-	-	2766
KS1	None	391	81.3	90	18.1	.19	.39	481
	Vocational	340	81.7	76	18.3	.18	.39	416
	16 academic	873	85.8	144	14.2	.14	.35	1017
	18 academic	195	80.9	46	19.1	.19	.39	241
	Degree or equivalent	298	82.5	63	17.5	.17	.38	361
	Higher degree	103	81.1	24	18.9	.19	.39	127
	Other professional/misc	37	88.1	5	11.9	.12	.32	42
	Total	2237	83.3	448	16.7	-	-	2685
KS2	None	347	75.4	113	24.6	.2457	.43094	460
	Vocational	305	76.1	96	23.9	.2394	.42725	401
	16 academic	788	80.0	197	20.0	.2000	.40020	985
	18 academic	178	78.1	50	21.9	.2193	.41468	228
	Degree or equivalent	26	75.5	86	24.5	.2450	.43071	351
	Higher degree	93	77.5	27	22.5	.2250	.41933	120
	Other professional/misc	30	78.9	8	21.1	.2105	.41315	38
	Total	2054	77.5	596	22.5	-	-	2650

Table B.10: Mobility by Father's Highest Qualification

Mobility	Father's Highest Qualification	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	None	292	73.4	106	26.6	.27	.44	398
	Vocational	231	72.6	87	27.4	.27	.45	318
	16 academic	425	68.9	192	31.1	.31	.46	617
	18 academic	156	71.6	62	27.4	.28	.45	218
	Degree or equivalent	217	59.8	146	40.2	.40	.50	363
	Higher degree	89	56	70	40	.44	.50	159
	Other professional/ misc	18	62.1	11	37.9	.37	.50	29
	Total	1428	67.9	674	32.1	-	-	2102
KS1	None	314	81.1	73	18.9	.19	.39	387
	Vocational	264	85.4	45	14.6	.15	.35	309
	16 academic	541	89.6	63	10.4	.10	.30	604
	18 academic	175	84.1	33	15.9	.16	.36	208
	Degree or equivalent	305	84.7	55	15.3	.15	.36	360
	Higher degree	111	73	41	27	.27	.45	152
	Other professional/ misc	26	89.7	3	10.3	.10	.30	29
	Total	1736	84.7	313	15.3	-	-	2049
KS2	None	295	79.3	77	20.7	.2070	.40569	372
	Vocational	237	78.5	65	21.5	.2152	.41167	302
	16 academic	484	82.5	103	17.5	.1755	.38069	587
	18 academic	162	79.4	42	20.6	.2059	.40534	204
	Degree or equivalent	260	74.7	88	25.3	.2529	.43528	348
	Higher degree	104	74.8	35	25.2	.2518	.43562	139
	Other professional/ misc	22	81.5	5	18.5	.1852	.39585	27
	Total	1564	79.0	415	21.0	-	-	1979

Table B.11: Mobility by Father's Employment

Mobility	Father's employment	Non-mobile		Mobile				Total sample
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	Employed full time	1007	67.7	481	32.3	.32	.47	1488
	Employed part time	59	80.8	14	19.2	.19	.40	73
	Self-employed + combination (p/t & self-employed)	208	59.5	113	35.2	.35	.47	321
	Not working	223	74.1	78	25.9	.26	.44	301
	Total	1399	64.1	784	35.9	-	-	2183
KS1	Employed full time	1247	85.8	207	14.2	.14	.35	1454
	Employed part time	58	85.3	10	14.7	.15	.36	68
	Self-employed + combination (p/t & self employed)	273	86.4	43	13.6	.13	.34	316
	Not working	229	78.7	62	21.3	.21	.41	291
	Total	1807	84.9	322	15.1	-	-	2129
KS2	Employed full time	1137	80.8	271	19.2	.1925	.39438	1408
	Employed part time	53	82.8	11	17.2	.1719	.38025	64
	Self-employed + combination (p/t & self-employed)	228	74.5	78	25.5	.2549	.43652	306
	Not working	206	73.8	73	26.2	.2616	.44032	279
	Total	1624	78.9	433	21.1	-	-	2057

Table B.12: Mobility by Mother's Employment

Mobility	Mother's Employment	Non-mobile		Mobile				Total sample
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	Employed full time	287	64.1	161	35.9	.36	.48	448
	Employed part time	570	66.2	291	33.8	.34	.47	861
	Self-employed + combination (p/t & self-employed)	74	58.3	53	41.7	.42	.50	127
	Not working	964	71.7	380	28.3	.29	45	1344
	Total	1895	68.2	885	31.8	-	-	2780
KS1	Employed full time	368	83.4	73	16.6	.17	.37	441
	Employed part time	728	86.6	111	13.2	.13	.34	839
	Self-employed + combination (p/t & self-employed)	98	77.8	28	22.2	.22	.42	126
	Not working	1056	81.7	237	18.3	.18	.39	1293
	Total	2250	83.4	449	16.6	-	-	2699
KS2	Employed full time	330	76.9	99	23.1	.2308	.42182	429
	Employed part time	646	79.1	171	20.9	.2093	.40706	817
	Self-employed + combination (p/t & self-employed)	100	81.3	23	18.7	.1870	.39150	123
	Not working	939	76.5	289	23.5	.2353	.42439	1228
	Total	2015	77.6	582	22.4	-	-	2597

Table B.13: Mobility by Ethnicity

Mobility	Ethnicity	Non-mobile		Mobile				Total
		n	%	n	%	Mean rate of Mobility	s.d.	n
Pre-school	White UK Heritage	1448	68.1	679	31.9	.32	.47	2127
	White European Heritage	78	66.1	40	33.9	.34	.48	118
	Black Caribbean Heritage	86	74.1	30	25.9	.26	.44	116
	Black African Heritage	39	60.9	25	39.1	.40	.50	64
	Any other ethnic minority Heritage	69	77.5	20	22.5	.22	.42	89
	Indian Heritage	40	72.7	15	27.3	.27	.45	55
	Pakistani Heritage	63	84	12	16	.16	.37	75
	Bangladeshi Heritage	23	92	2	8	.08	.28	25
	Mixed Heritage	114	61.6	71	38.4	.39	.28	185
	Total	1960	68.7	894	31.3	-	-	2854
KS1	White UK Heritage	1753	84.5	321	15.5	.15	.36	2074
	White European Heritage	94	87	14	13	.12	.34	108
	Black Caribbean Heritage	88	80	22	20	.20	.40	110
	Black African Heritage	48	78.7	13	21.3	.21	.42	61
	Any other ethnic minority Heritage	61	74.4	21	25.6	.26	.44	82
	Indian Heritage	45	84.9	8	15.1	.15	.36	53
	Pakistani Heritage	50	79.4	13	20.6	.20	.41	63
	Bangladeshi Heritage	15	75	5	25	.25	.44	20
	Mixed Heritage	132	73.3	48	26.7	.26	.44	180
	Total	2286	83.1	465	16.9	-	-	2751
KS2	White UK Heritage	1562	77.3	458	22.7	.2267	.41882	2020
	White European Heritage	68	68.0	32	32.0	.3200	100	100
	Black Caribbean Heritage	93	86.1	15	13.9	.1389	108	108
	Black African Heritage	43	74.1	15	25.9	.2586	58	58
	Any other ethnic minority Heritage	57	81.4	13	18.6	.1857	70	70
	Indian Heritage	40	80.0	10	20.0	.2000	50	50
	Pakistani Heritage	50	83.3	10	16.7	.1667	60	60
	Bangladeshi Heritage	15	75.0	5	25.0	.2500	20	20
	Mixed Heritage	125	77.2	37	22.8	.2284	162	162
	Total	2053	77.5	595	22.5	-	-	2648

Appendix C: Composition of Mobility Groups

Pre-school and Duration
It was noted in Section 8, 'Mobility and Pre-school Type' that:

> "Children who started pre-school at a young age (attending for two years or more) were more likely to attend Private day nurseries, Playgroups and Local Authority day nurseries (which cater for children of younger ages). Playgroup children start at an earlier age therefore they have a greater period in which to move".

It is also the case that children who attend Private day nurseries, Playgroups and Local Authority day nurseries tend to be from more socially advantaged backgrounds. Consequently, the finding shown in Table 12, that more socially advantaged EPPE 3-11 children tend to be mobile during the pre-school period, maybe due simply to such children having more opportunity to move, having been at pre-school longer. To test this possibility the logistic regression analysis presented in Table 12 is replicated along with an additional variable measuring the duration of EPPE 3-11 children's pre-school attendance in months. Table C.1 shows the results of the analysis.

Table C.1.: Significant Predictors for At Least One Pre-school Move (N =2766)

Potential Background Factors	Logistic r	S.E.	Odds Ratio
Duration of Preschool	0.04	0.01	1.04***
Eligibility for FSM	-.28	0.14	0.75*
Mother's Highest Qualification	0.16	0.03	1.17***

* $p < .05$; ** $p < .01$; *** $p < .001$.

Although significant, duration of attendance at pre-school did not eliminate mother's highest qualification as a significant predictor, nor Eligibility for FSM. Consequently these measures of social advantage remain predictive of pre-school mobility, and the claims concerning them valid.

Appendix D: Cognitive Outcomes

Table D.1.1: Model Properties for Early Number Scores at Reception: Null, Demographic and Two Mobility Groups Models (N =2631)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	50.20	25.75	25.64
Level 2 Variance	90.15	62.84	62.85
Level 1 Variance	14.46	3.58	3.59
-2 LLR	-19500	-18336	-18335

Table D.1.2: Early number concepts at Reception Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	S.E.	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.00	0.05	0.93		0.00
Gender: Boys	**Gender: Girls**	0.83	0.32	0.01	*	0.10
Block Building	**Continuous Variable**	0.72	0.22	0.00	*	1.67
Verbal Comprehension	**Continuous Variable**	0.18	0.09	0.05	*	0.45
Picture Naming	**Continuous Variable**	0.10	0.09	0.26		0.25
Picture Similarities	**Continuous Variable**	0.57	0.22	0.01	*	1.46
General Cognitive Ability	**Continuous Variable**	0.02	0.17	0.89		0.09
Non-Verbal Composite	**Continuous Variable**	-0.54	0.23	0.02	*	-2.02
Development Problems: None	**Missing**	0.98	1.00	0.32		0.12
	At least one	0.48	6.09	0.94		0.06
	More than one	-1.77	0.52	0.00	*	-0.22
Father's Qualification: None	**Missing**	-1.17	1.56	0.45		-0.15
	Vocational	-2.26	4.08	0.58		-0.29
	16 academic	0.74	0.67	0.27		0.09
	18 academic	0.12	0.58	0.83		0.02
	Degree or equivalent	-0.39	0.77	0.61		-0.05
	Higher degree	0.49	0.76	0.52		0.06
	Other professional	1.46	1.07	0.17		0.18
	Father absent	-0.15	1.65	0.93		-0.02
Family Socio Economic Status (SES): Professional non-manual	**Missing**	0.56	0.57	0.32		0.07
	Other professional non-manual	-0.62	2.60	0.81		-0.08
	Skilled non-manual	-0.67	0.67	0.32		-0.08
	Skilled manual	-1.54	0.77	0.05	*	-0.19
	Semi-skilled	-1.59	0.87	0.07		-0.20
	Unskilled	-2.90	0.90	0.00	*	-0.37
	Unemployed: not working	-2.53	1.37	0.06		-0.32
Eligibility for Free School Meals (FSM): None	**Missing**	1.51	1.42	0.29		0.19
	No FSM	-0.59	0.37	0.11		-0.07

Mother's Highest Qualification	**Missing**	-0.99	1.37	0.47		-0.13
	Vocational	0.85	1.69	0.62		0.11
	16 academic	-0.11	0.61	0.86		-0.01
	18 academic	0.94	0.52	0.07		0.12
	Degree or equivalent	1.48	0.75	0.05	*	0.19
	Higher degree	0.68	0.76	0.37		0.09
	Other professional	0.43	1.12	0.70		0.05
Birth weight: Normal	**Birth weight: Missing**	-0.86	0.66	0.20		-0.11
	Birth weight: very low<=1500g	2.73	1.43	0.06		0.34
	Birth weight: low 1501-2500g	-4.43	1.38	0.00	*	-0.56
Number of siblings: singleton	**Missing**	-1.12	0.65	0.09		-0.14
	Siblings 1-2	-4.08	2.90	0.16		-0.51
	Siblings 3+	-0.23	0.41	0.58		-0.03
Ethnicity: White UK Heritage	**White European Heritage**	-0.47	0.59	0.43		-0.06
	Black Caribbean Heritage	0.44	0.94	0.64		0.06
	Black African Heritage	0.31	0.88	0.73		0.04
	Any other ethnic minority Heritage	-0.09	1.20	0.94		-0.01
	Indian Heritage	0.51	1.13	0.65		0.06
	Pakistani Heritage	3.04	1.38	0.03	*	0.38
	Bangladeshi Heritage	-1.58	1.43	0.27		-0.20
	Mixed Race Heritage	1.94	2.35	0.41		0.25
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	0.10	0.68	0.88		0.01
	0-13	-1.35	1.42	0.34		-0.17
	14-19	-3.82	0.81	0.00	*	-0.48
	20-24	-2.11	0.62	0.00	*	-0.27
	25-32	-1.41	0.58	0.02	*	-0.18
Duration at pre-school centre: Greater than 36 months	**Missing**	-0.92	0.54	0.09		-0.12
	'Home' Children	-1.63	0.72	0.02	*	-0.21
	0-12	-0.61	0.64	0.34		-0.08
	12-24	-0.30	0.63	0.63		-0.04
	24-36	-2.18	0.77	0.01	*	-0.27
% of Mother's with Degree by pre-school centre: 75-100%	**'Home' Children**	-1.54	0.75	0.04	*	-0.19
	0-25%	-0.08	0.78	0.92		-0.01
	25% - 50%	-1.88	0.72	0.01	*	-0.24
Pre-school mobility: Non-mobility	**Moved at least once**	0.21	0.37	0.57		0.03

Table D.1.3: Model Properties for Pre-reading scores at Reception: Null, Demographic and Two Mobility Groups Models (N =2629)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	50.11	30.70	30.87
Level 2 Variance	73.14	51.03	50.99
Level 1 Variance	18.23	4.78	4.78
-2 LLR	-18983	-17843	-17841

Table D.1.4: Pre-reading scores Reception Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Std. Err	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	-0.10	0.04	0.02	*	-0.11
Gender: Boys	**Gender: Girls**	1.46	0.29	0.00	*	0.20
Block Building	**Continuous Variable**	0.18	0.20	0.37		0.46
Verbal Comprehension	**Continuous Variable**	-0.01	0.08	0.89		-0.03
Picture Naming	**Continuous Variable**	0.00	0.08	1.00		0.00
Picture Similarities	**Continuous Variable**	0.07	0.20	0.74		0.19
General Cognitive Ability	**Continuous Variable**	0.34	0.15	0.03	*	1.42
Non-Verbal Composite	**Continuous Variable**	-0.23	0.20	0.27		-0.95
Time at centre	**Continuous Variable**	0.54	0.19	0.00	*	0.13
None Parental Care Givers: None	**Missing**	5.17	5.49	0.35		0.72
	One	0.32	0.36	0.37		0.04
	Two	0.29	0.43	0.50		0.04
	Three +	0.20	0.55	0.71		0.03
Development Problems: None	**Missing**	0.00	0.00	.		0.00
	At least one	-1.09	0.47	0.02	*	-0.15
	More than one	-1.58	1.41	0.26		-0.22
Father's Highest Qualification: None	**Missing**	-5.90	3.69	0.11		-0.83
	Vocational	0.84	0.60	0.17		0.12
	16 academic	0.53	0.53	0.32		0.07
	18 academic	0.59	0.70	0.40		0.08
	Degree or equivalent	1.66	0.69	0.02	*	0.23
	Higher degree	1.38	0.96	0.15		0.19
	Other professional	1.85	1.49	0.22		0.26
	Father absent	-0.15	0.51	0.77		-0.02
Family socio-economic status (SES): Professional non-manual	**Missing**	-0.25	2.35	0.92		-0.03
	Other professional non-manual	-0.90	0.61	0.14		-0.13
	Skilled non-manual	-0.91	0.70	0.19		-0.13
	Skilled manual	-0.83	0.79	0.29		-0.12
	Semi-skilled	-0.92	0.81	0.26		-0.13

Family socio-economic status (SES): Professional non-manual	**Unskilled**	-1.47	1.24	0.23		-0.21
	Unemployed: not working	-0.47	1.23	0.70		-0.07
Mother's Highest Qualification: Highest	**Missing**	0.16	1.52	0.92		0.02
	Vocational	-0.19	0.55	0.73		-0.03
	16 academic	0.41	0.47	0.39		0.06
	18 academic	1.43	0.67	0.03	*	0.20
	Degree or equivalent	1.51	0.69	0.03	*	0.21
	Higher degree	2.20	1.01	0.03	*	0.31
	Other professional	3.87	1.27	0.00	*	0.54
Eligibility for Free School Meals (FSM): None	**Missing**	-0.35	0.36	0.34		-0.05
	No FSM	-1.03	0.48	0.03	*	-0.14
Birth weight: Normal	**Birth weight: Missing**	-0.95	1.29	0.46		-0.13
	Birth weight: very low<=1500g	-1.31	1.25	0.30		-0.18
	Birth weight: low 1501-2500g	-1.30	0.59	0.03	*	-0.18
Number of siblings: singleton	**Missing**	-1.93	2.62	0.46		-0.27
	Siblings 1 -2	-0.55	0.37	0.14		-0.08
	Siblings 3+	-1.73	0.54	0.00	*	-0.24
Ethnicity: White UK Heritage	**White European Heritage**	-0.77	0.83	0.36		-0.11
	Black Caribbean Heritage	2.48	0.81	0.00	*	0.35
	Black African Heritage	4.90	1.08	0.00	*	0.69
	Any other ethnic minority Heritage	3.56	0.99	0.00	*	0.50
	Indian Heritage	3.94	1.18	0.00	*	0.55
	Pakistani Heritage	2.69	1.18	0.02	*	0.38
	Bangladeshi Heritage	3.49	2.03	0.09		0.49
	Mixed Race Heritage	1.25	0.62	0.04	*	0.17
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-0.57	1.28	0.65		-0.08
	0-13	-4.06	0.73	0.00	*	-0.57
	14-19	-2.81	0.56	0.00	*	-0.39
	20-24	-2.18	0.53	0.00	*	-0.31
	25-32	-1.18	0.49	0.02	*	-0.16
Duration at pre-school centre: Greater than 36 months	**Missing**	-3.92	0.78	0.00		-0.55
	'Home' Children	-3.20	0.76	0.00		-0.45
	0-12	-1.55	0.80	0.05		-0.22
	12-24	-2.66	0.74	0.00		-0.37
	24-36	0.00	0.00	.		0.00
Pre-school mobility: Non-mobility	**One move or more**	-0.56	0.34	0.09		-0.08

Table D.1.5: Model Properties for Total Verbal Ability scores at Reception: Null, Demographic and Two Mobility Groups Models (N =2629)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	50.28	21.33	21.18
Level 2 Variance	62.35	30.74	30.72
Level 1 Variance	18.68	1.45	1.49
-2 LLR	-18697	-16528	-16528

Table D.1.6: Total Verbal Ability scores at Reception Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	S.E.	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	-0.04	0.03	0.23		-0.06
Block Building	**Continuous Variable**	0.06	0.15	0.71		0.19
Verbal Comprehension	**Continuous Variable**	0.15	0.06	0.01	*	0.55
Picture Naming	**Continuous Variable**	0.25	0.06	0.00	*	0.90
Picture Similarities	**Continuous Variable**	0.01	0.15	0.96		0.03
General Cognitive Ability	**Continuous Variable**	0.14	0.12	0.24		0.75
Non-Verbal Composite	**Continuous Variable**	-0.06	0.16	0.72		-0.30
None Parental Care Givers: None	**Missing**	3.45	3.14	0.27		0.62
	One	0.21	0.28	0.44		0.04
	Two	0.27	0.33	0.43		0.05
	Three+	0.59	0.43	0.17		0.11
English as an additional language (EAL):Yes	**EAL: No**	0.68	0.69	0.33		0.12
Development Problems: None	**Missing**	0.00	0.00	.		0.00
	At least one	-0.72	0.36	0.05	*	-0.13
	More than one	-0.11	1.08	0.92		-0.02
Family socio-economic status (SES): Professional non-manual	**Other professional non-manual**	-0.55	1.80	0.76		-0.10
	Skilled non-manual	-0.23	0.44	0.60		-0.04
	Skilled manual	-0.80	0.49	0.10		-0.14
	Semi-skilled	-1.33	0.57	0.02	*	-0.24
	Unskilled	-1.97	0.58	0.00	*	-0.36
	Unemployed: not working	-2.40	0.92	0.01	*	-0.43
	Missing	-2.97	0.91	0.00	*	-0.54
Mother's Highest Qualification: Highest	**Missing**	-0.79	1.17	0.50		-0.14
	Vocational	-0.36	0.42	0.39		-0.06
	16 academic	0.21	0.36	0.55		0.04
	18 academic	0.80	0.51	0.12		0.14
	Degree or equivalent	1.25	0.51	0.01	*	0.23
	Higher degree	1.60	0.71	0.02	*	0.29
	Other professional	-0.27	0.96	0.78		-0.05

Eligibility for Free School Meals (FSM): None	**Missing**	-0.34	0.27	0.22		-0.06
	No FSM	-0.69	0.37	0.06		-0.12
Birth weight: Normal	**Birth weight: Missing**	0.70	0.99	0.48		0.13
	Birth weight: very low<=1500g	-1.53	0.95	0.11		-0.28
	Birth weight: low 1501-2500g	0.07	0.46	0.88		0.01
Number of siblings: singleton	**Missing**	-3.95	2.03	0.05		-0.71
	Siblings 1-2	-0.44	0.28	0.12		-0.08
	Siblings 3+	-0.39	0.41	0.35		-0.07
Ethnicity: White UK Heritage	**White European Heritage**	-0.45	0.65	0.49		-0.08
	Black Caribbean Heritage	-2.02	0.61	0.00	*	-0.36
	Black African Heritage	-2.28	0.83	0.01	*	-0.41
	Any other ethnic minority Heritage	-2.08	0.78	0.01	*	-0.38
	Indian Heritage	-2.70	0.96	0.00	*	-0.49
	Pakistani Heritage	-3.92	1.00	0.00	*	-0.71
	Bangladeshi Heritage	-2.67	1.62	0.10		-0.48
	Mixed Race Heritage	-1.15	0.47	0.01	*	-0.21
Duration at pre-school centre: Greater than 36 months	**0-12**	-1.33	0.50	0.01	*	-0.24
	12-24	-0.44	0.44	0.33		-0.08
	24-36	-0.43	0.44	0.33		-0.08
Percentage of Children in Centres with Mothers Who've a Degree: 75-100%	**Missing**	-1.30	0.52	0.01	*	-0.23
	0-25%	-1.24	0.50	0.02	*	-0.22
	25-50%	-0.42	0.52	0.42		-0.08
	50-75%	-1.02	0.48	0.04	*	-0.18
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-0.93	0.98	0.35		-0.17
	0-13	-2.16	0.55	0.00	*	-0.39
	14-19	-0.90	0.43	0.04	*	-0.16
	20-24	-0.44	0.40	0.28		-0.08
	25-32	-0.28	0.37	0.45		-0.05
Pre-school mobility: Non-mobility	**One move or more**	0.27	0.26	0.30		0.05

Table D.1.7: Model Properties for Early Number at Reception: Null, Demographic and Four Mobility Groups Models (N =2629)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	50.20	25.83	25.38
Level 2 Variance	90.15	62.84	62.83
Level 1 Variance	14.46	3.56	3.63
-2 LLR	-19500	-18343	-18340

Table D.1.8: Model Properties for Pre-reading at Reception: Null, Demographic and Four Mobility Groups Models (N = 2238)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	50.11	30.70	30.26
Level 2 Variance	73.13	51.03	50.91
Level 1 Variance	18.23	4.78	4.79
-2 LLR	-18983	-17843	-17833

Table D.1.9: Model Properties for Total Verbal at Reception: Null, Demographic and Four Mobility Groups Models (N = 2636)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	50.29	21.35	16.84
Level 2 Variance	62.24	30.75	30.67
Level 1 Variance	18.60	1.39	1.42
-2 LLR	-18629	-16541	-16532

Table D.2.1: Model Properties for Mathematics scores KS1: Null, Demographic and Two Mobility Groups Models (N = 2223)

	Null Model	Model 1: Demographic	Model 2: 2 Group Mobility
Intercept	101.05	41.91	42.23
Level 2 Variance	201.29	121.2	121.03
Level 1 Variance	15.52	10.49	10.41
-2 LLR	-18209	-17006	-17002

Table D.2.2: Mathematics at KS1 Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Std. Err	P>z	Sig	Effect Size
Age at test	**Continuous variable**	0.09	0.07	0.18		0.06
Gender: Boys	**Gender: Girls**	-3.39	0.49	0.00	*	-0.31
Early numbers	**Continuous test score**	0.32	0.03	0.00	*	0.58
Total Verbal	**Continuous test score**	0.24	0.04	0.00	*	0.40
Pre-reading	**Continuous test score**	0.33	0.04	0.00	*	0.58
Pattern construction	**Continuous test score**	0.23	0.03	0.00	*	0.39
Picture similarities	**Continuous test score**	0.14	0.03	0.00	*	0.23
English as an additional language (EAL):Yes	**EAL: No**	3.98	1.15	0.00	*	0.36
Development Problems: None	**Missing**	-6.05	12.03	0.62		-0.55
	At least one	-0.65	0.77	0.40		-0.06
	More than one	-1.22	2.06	0.56		-0.11
Family socio-economic status (SES): Professional non-manual	**Missing**	-3.21	3.63	0.38		-0.29
	Other professional non-manual	-1.57	0.98	0.11		-0.14
	Skilled non-manual	-2.69	1.07	0.01	*	-0.24
	Skilled manual	-2.39	1.23	0.05		-0.22
	Semi-skilled	-2.86	1.28	0.03	*	-0.26
	Unskilled	-2.13	2.00	0.29		-0.19
	Unemployed: not working	-0.45	2.03	0.82		-0.04
Mother's Highest Qualification: Highest	**Missing**	-0.35	2.56	0.89		-0.03
	Vocational	1.27	0.91	0.16		0.12
	16 academic	0.36	0.76	0.64		0.03
	18 academic	2.39	1.11	0.03	*	0.22
	Degree or equivalent	0.12	1.09	0.91		0.01
	Higher degree	0.33	1.54	0.83		0.03
	Other professional	2.41	2.02	0.23		0.22
Eligibility for Free School Meals (FSM): None	**Missing**	-2.04	0.69	0.00	*	-0.19
	No FSM	-1.23	0.77	0.11		-0.11

Father's Employment Status: Employed full time	**Missing**	11.27	11.90	0.34		1.02
	Unemployed	0.14	0.89	0.87		0.01
	Employed part time	-0.90	1.61	0.58		-0.08
	Self-employed	-1.23	0.78	0.11		-0.11
	Father absent	0.03	0.72	0.97		0.00
Birth weight: Normal	**Birth weight: Missing**	-1.20	2.14	0.57		-0.11
	Birth weight: very low<=1500g	-3.34	2.00	0.10		-0.30
	Birth weight: low 1501-2500g	-0.83	1.01	0.41		-0.08
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-3.96	1.99	0.05	*	-0.36
	0-13	-0.43	1.22	0.72		-0.04
	14-19	-0.01	0.94	0.99		0.00
	20-24	-0.63	0.89	0.48		-0.06
	25-32	-0.75	0.82	0.36		-0.07
KS1 mobility: Non-mobility	**At least one move during KS1**	-1.36	0.71	0.06		-0.12

Table D.2.3: Model Properties for Reading scores KS1: Null, Demographic and Two Mobility Groups Models (N = 2266)

	Null Model	Model 1: Demographic	Model 2: 2 Group Mobility
Intercept	101.13	45.89	45.96
Level 2 Variance	20.55	7.18	7.17
Level 1 Variance	191.93	107.83	106.87
-2 LLR	-18479	-16993	-16992

Table D.2.4: Reading at KS1 Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	S.E.	P>z	Sig	Effect Size
Age at test	**Continuous variable**	0.06	0.07	0.36		0.04
Gender: Boys	**Gender: Girls**	1.08	0.46	0.02	*	0.10
Early numbers	**Continuous test score**	0.23	0.03	0.00	*	0.45
Total Verbal	**Continuous test score**	0.29	0.04	0.00	*	0.50
Pre-reading	**Continuous test score**	0.45	0.03	0.00	*	0.84
Pattern construction	**Continuous test score**	0.11	0.03	0.00	*	0.20
Picture similarities	**Continuous test score**	0.10	0.03	0.00	*	0.19
English as an additional language (EAL): Yes	**EAL :No**	-2.41	1.31	0.07		-0.23
Development Problems: None	**Missing**	-7.67	11.62	0.51		-0.74
	At least one	-1.09	0.72	0.13		-0.11
	More than one	-3.70	1.99	0.06		-0.36
Family socio-economic status (SES): Professional non-manual	**Missing**	0.29	3.42	0.93		0.03
	Other professional non-manual	-1.28	0.92	0.16		-0.12
	Skilled non-manual	-1.60	1.00	0.11		-0.15
	Skilled manual	-2.26	1.15	0.05	*	-0.22
	Semi-skilled	-3.65	1.19	0.00	*	-0.35
	Unskilled	-4.58	1.84	0.01	*	-0.44
	Unemployed: not working	-2.10	1.88	0.27		-0.20
Mother's Highest Qualification: Highest	**Missing**	-2.62	2.35	0.27		-0.25
	Vocational	1.20	0.84	0.16		0.12
	16 academic	1.45	0.71	0.04	*	0.14
	18 academic	2.32	1.04	0.03	*	0.22
	Degree or equivalent	2.68	1.02	0.01	*	0.26
	Higher degree	2.17	1.43	0.13		0.21
	Other professional	3.78	1.90	0.05	*	0.37
Father's Employment Status: Employed full time	**Missing**	9.12	11.47	0.43		0.88
	Unemployed	-0.60	0.82	0.47		-0.06
	Employed part time	-0.25	1.50	0.87		-0.02
	Self-employed	-2.71	0.73	0.00	*	-0.26
	Father absent	-0.39	0.68	0.57		-0.04

Eligibility for Free School Meals (FSM): None	**Missing**	-0.64	0.63	0.31		-0.06
	No FSM	-0.88	0.72	0.22		-0.09
Birth weight: Normal	**Birth weight: Missing**	-1.46	2.02	0.47		-0.14
	Birth weight: very low<=1500g	-4.75	1.88	0.01	*	-0.46
	Birth weight: low 1501-2500g	0.77	0.94	0.41		0.07
Ethnicity: White UK Heritage	**White European Heritage**	-1.85	1.30	0.16		-0.18
	Black Caribbean Heritage	2.53	1.22	0.04	*	0.25
	Black African Heritage	2.04	1.68	0.22		0.20
	Any other ethnic minority Heritage	-0.34	1.51	0.82		-0.03
	Indian Heritage	3.41	1.92	0.08		0.33
	Pakistani Heritage	3.96	1.95	0.04	*	0.38
	Bangladeshi Heritage	3.80	3.14	0.23		0.37
	Mixed Race Heritage	-0.01	1.00	0.99		0.00
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-2.99	1.88	0.11		-0.29
	0-13	-2.63	1.13	0.02	*	-0.25
	14-19	-1.71	0.87	0.05	*	-0.17
	20-24	-1.90	0.82	0.02	*	-0.18
	25-32	-1.11	0.76	0.14		-0.11
KS1 mobility: Non-mobility	**At least one move during KS1**	-0.33	0.65	0.61		-0.03

Table D.2.5: Model Properties for Mathematics scores KS1: Null, Demographic and Four Mobility Groups Models (N = 2223)

	Null Model	Model 1: Demographic	Model 2: 4 group Mobility
Intercept	101.06	47.31	48.46
Level 2 Variance	201.29	118.43	117.40
Level 1 Variance	15.53	10.79	10.99
-2 LLR	-18209	-12900	-12879

Table D.2.6: Model Properties for Reading scores KS1: Null, Demographic and Four Mobility Groups Models (N = 2266)

	Null Model	Model 1: Demographic	Model 2: 2 Group Mobility
Intercept	101.13	48.42	49.75
Level 2 Variance	191.94	101.39	101.05
Level 1 Variance	20.55	7.18	7.08
-2 LLR	-18479	-12842	-12828

Table D.3.1: Model Properties for Mathematics KS2 Two Mobility Groups (N = 2129)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	27.95	33.50	33.91
Level 2 Variance	93.68	88.57	88.21
Level 1 Variance	19.36	16.25	16.49
-2 LLR	-8009	-7857	-7852

Table D.3.2: Mathematics at KS2: Two Mobility Groups: coefficients, errors, p values, effect sizes

Comparison Group	Categories	Coeff	S.E.	P < z	Sig	Effect Size
Mathematics Year 2	**Continuous Variable**	0.65	0.02	0.00	*	1.98
Age	**Continuous Variable**	0.01	0.06	0.82		0.17
Gender: Girls	**Gender: Boys**	-0.79	0.45	0.08		-0.08
Eligibility for Free School Meals (FSM): None	**Missing**	-0.16	0.71	0.82		-0.02
	No FSM	-2.85	1.79	0.11		-0.17
English as an additional language (EAL): Yes	**EAL: Missing**	4.38	7.09	0.54		0.07
	EAL: No	0.40	0.71	0.57		0.06
Development Problems: None	**Missing**	-3.41	3.94	0.39		-0.09
	At least one	0.04	0.71	0.95		0.01
	More than one	-3.50	2.02	0.08		-0.19
Birth weight: Normal	**Birth weight: Missing**	2.15	1.92	0.26		0.12
	Birth weight: very low<=1500g	-1.89	1.93	0.33		-0.10
	Birth weight: low 1501-2500g	-0.14	0.92	0.88		-0.02
Ethnicity: UK White Heritage	**White European Heritage**	0.36	1.25	0.78		0.03
	Black Caribbean Heritage	0.58	1.16	0.62		0.05
	Black African Heritage	0.93	1.62	0.57		0.06
	Any other ethnic minority Heritage	0.22	1.41	0.88		0.02
	Indian Heritage	3.32	1.76	0.06		0.20
	Pakistani Heritage	2.22	1.67	0.18		0.14
	Bangladeshi Heritage	4.11	2.64	0.12		0.17
	Mixed race Heritage	0.59	0.99	0.55		0.06
Income: None	**Missing**	2.53	1.54	0.10		0.17
	£ 2,500 – 17,499	0.45	1.08	0.67		0.04
	£ 17,500 – 29,999	0.89	1.11	0.43		0.09
	£ 30,000 – 37,499	1.02	1.19	0.39		0.09
	£ 37,500 – 67,499	1.68	1.16	0.15		0.15
	£ 67,500 – 132,000+	0.10	1.56	0.95		0.01

Family socio-economic status (SES): Professional non-manual	**Other professional non-manual**	-0.51	0.88	0.57		-0.06
	Skilled non-manual	-1.13	1.00	0.26		-0.12
	Skilled manual	-1.95	1.04	0.06		-0.20
	Semi-skilled	-2.11	1.23	0.09		-0.18
	Unskilled	-1.98	1.84	0.28		-0.11
	Unemployed: not working	-2.21	1.39	0.11		-0.17
	Missing	-5.13	3.14	0.10		-0.17
Mother's Highest Qualification: Highest	**Missing**	3.49	2.37	0.14		0.16
	Vocational	1.09	0.83	0.19		0.14
	16 academic	1.45	0.69	0.04	*	0.22
	18 academic	1.92	1.01	0.06		0.20
	Degree or equivalent	4.94	1.05	0.00	*	0.50
	Higher degree	5.64	1.59	0.00	*	0.38
	Other professional	5.06	1.89	0.01	*	0.29
Father's Highest Qualification: Highest	**Missing**	-0.76	0.75	0.31		-0.11
	Vocational	-1.16	0.89	0.19		-0.14
	16 academic	-0.51	0.77	0.51		-0.07
	18 academic	-0.78	1.05	0.46		-0.08
	Degree or equivalent	1.35	1.04	0.19		0.14
	Higher degree	2.28	1.53	0.14		0.16
	Other professional	2.10	2.35	0.37		0.10
Early years Home Learning Environment (HLE) Index: Lowest	**Missing**	0.59	1.94	0.76		0.03
	14-19	0.01	0.93	0.99		0.00
	20-24	0.57	0.95	0.55		0.06
	25-32	0.63	0.94	0.50		0.07
	33-43	2.35	1.11	0.03	*	0.23
KS1 Home Learning Environment (HLE) Interactions: High	**Missing**	-2.35	1.46	0.11		-0.17
	Low	-0.56	0.93	0.55		-0.06
	Low-Moderate	-0.25	0.79	0.75		-0.03
	Moderate-High	-0.12	0.75	0.87		-0.02
KS2 Mobility: Non-mobile	**Mobile KS2 missing**	-1.21	1.91	0.53		-0.07
	Mobile KS2	-1.44	0.58	0.01	*	-0.27

Table D.3.3: Model Properties for Reading KS2 Two Mobility Groups (N = 2165)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	24.19	28.15	28.50
Level 2 Variance	88.78	83.86	83.74
Level 1 Variance	17.00	15.20	15.28
-2 LLR	-8077	-7929	-7926

Table D.3.4: Reading at KS2: Two Mobility Groups: coefficients, error, p values, effect sizes

Comparison Group	Experimental Group	Coeff	S.E.	P < z	Sig	Effect Size
Mathematics Year 2	**Continuous Variable**	0.67	0.02	0.00	*	2.05
Age	**Continuous Variable**	-0.01	0.06	0.86		-0.01
Gender: Girls	**Gender: Boys**	2.42	0.43	0.00	*	0.26
Eligibility for Free School Meals (FSM): None	**Missing**	0.01	0.68	0.99		0.00
	No FSM	-2.12	1.72	0.22		-0.23
English as an additional language (EAL): Yes	**EAL: Missing**	-2.37	6.91	0.73		-0.26
	EAL: No	0.89	0.69	0.20		0.10
Development Problems: None	**Missing**	1.12	3.83	0.77		0.12
	At least one	-0.93	0.68	0.17		-0.10
	More than one	-0.62	2.00	0.76		-0.07
Birth weight: Normal	**Birth weight: Missing**	-0.26	1.87	0.89		-0.03
	Birth weight: very low<=1500g	0.82	1.82	0.65		0.09
	Birth weight: low 1501-2500g	-0.16	0.89	0.86		-0.02
Ethnicity: White UK Heritage	**White European Heritage**	0.30	1.23	0.80		0.03
	Black Caribbean Heritage	0.38	1.12	0.73		0.04
	Ethnicity: Heritage	-0.38	1.56	0.81		-0.04
	Any other ethnic minority Heritage	1.23	1.32	0.35		0.13
	Indian Heritage	0.50	1.68	0.77		0.05
	Pakistani Heritage	2.09	1.62	0.20		0.23
	Bangladeshi Heritage	3.26	2.49	0.19		0.36
	Mixed race Heritage	0.38	0.95	0.69		0.04
Income: None	**Missing**	-0.79	1.50	0.60		-0.09
	£ 2,500 – 17,499	0.05	1.06	0.96		0.01
	£ 17,500 – 29,999	-0.92	1.09	0.40		-0.10
	£ 30,000 – 37,499	-1.46	1.17	0.21		-0.16
	£ 37,500 – 67,499	0.01	1.14	0.99		0.00
	£ 67,500 – 132,000+	-0.15	1.52	0.92		-0.02

Family socio-economic status (SES): Professional non-manual	**Missing**	0.46	0.85	0.59		0.05
	Other professional non-manual	-0.30	0.96	0.75		-0.03
	Skilled non-manual	-1.70	1.01	0.09		-0.19
	Skilled manual	-1.04	1.19	0.38		-0.11
	Semi-skilled	-0.85	1.80	0.64		-0.09
	Unskilled	-2.83	1.35	0.04	*	-0.31
	Unemployed: not working	0.52	3.00	0.86		0.06
Mother's Highest Qualification: Highest	**Missing**	0.33	2.26	0.89		0.04
	Vocational	2.20	0.80	0.01	*	0.24
	16 academic	1.43	0.67	0.03	*	0.16
	18 academic	1.93	0.98	0.05	*	0.21
	Degree or equivalent	4.69	1.02	0.00	*	0.51
	Higher degree	3.34	1.53	0.03	*	0.36
	Other professional	4.85	1.84	0.01	*	0.53
Father's Highest Qualification: Highest	**Missing**	0.32	0.72	0.66		0.04
	Vocational	0.72	0.86	0.40		0.08
	16 academic	0.42	0.74	0.57		0.05
	18 academic	0.93	1.02	0.36		0.10
	Degree or equivalent	1.19	1.00	0.23		0.13
	Higher degree	2.08	1.48	0.16		0.23
	Other professional	1.02	2.28	0.66		0.11
Early years Home Learning Environment (HLE) Index: Lowest	**Missing**	-2.46	1.93	0.20		-0.27
	14-19	0.20	0.89	0.82		0.02
	20-24	0.09	0.91	0.92		0.01
	25-32	0.52	0.90	0.57		0.06
	33-43	2.42	1.07	0.02	*	0.26
KS1 Home Learning Environment (HLE) Computer Use: High	**Low**	1.58	1.49	0.29		0.17
	Low - Moderate	2.19	0.86	0.01	*	0.24
	Moderate-High	1.03	0.76	0.18		0.11
KS1 Home Learning Environment (HLE) Interactions: High	**Missing**	0.11	0.71	0.88		0.01
	Low	1.26	0.90	0.16		0.14
	Low - Moderate	0.61	0.77	0.43		0.07
	Moderate-High	0.56	0.72	0.43		0.06
KS2 Mobility: Non-mobile	**Mobile KS2 missing**	-0.94	1.82	0.60		-0.10
	Mobile KS2	-1.06	0.56	0.06		-0.12

Table D.3.5: Model Properties for Mathematic KS2: Four Mobility Groups (N = 2129)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	27.95	33.50	33.82
Level 2 Variance	93.68	88.57	88.31
Level 1 Variance	19.36	16.25	16.42
-2 LLR	-8009	-7857	-7850

Table D.3.6: Model Properties for Reading at KS2: Four Mobility Groups (N =2165)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	24.19	28.15	27.97
Level 2 Variance	88.78	83.86	83.59
Level 1 Variance	17.00	15.20	15.30
-2 LLR	-8077	-7929	-7922

Table D.3.7: Model Properties for Mathematic KS2: Four Mobility Groups (N = 2129)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	27.95	33.50	33.90
Level 2 Variance	93.68	88.57	88.30
Level 1 Variance	19.36	16.25	16.43
-2 LLR	-8009	-7857	-7851

Table D.3.8: Model Properties for Reading at KS2: Four Mobility Groups (N =2165)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	24.19	28.15	28.69
Level 2 Variance	88.78	83.86	83.73
Level 1 Variance	17.00	15.20	15.32
-2 LLR	-8077	-7929	-7925

Appendix E: Social/behavioural Outcomes

Table E.1.1: Model Properties for 'Co-operation & Conformity' at Reception: Null, Demographic and Two Mobility Groups Models (N = 2565)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	3.91	2.98	2.32
Level 2 Variance	.44	.34	.50
Level 1 Variance	.03	.02	.03
-2 LLR	-5296	-4757	-4743

Table E.1.2: 'Co-operation & Conformity' at Reception: Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	S.E.	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.01	0.00	0.00	*	0.14
Gender: Boys	**Gender: Girls**	0.23	0.03	0.00	*	0.36
'Co-operation & Conformity'	**Continuous Variable**		0.04	0.00	*	0.74
'Peer Sociability'	**Continuous Variable**		0.39	0.25		0.07
'Confidence'	**Continuous Variable**		0.36	0.00	*	-0.25
'Anti-social' behaviour	**Continuous Variable**		0.04	0.00	*	-0.20
'Worried/upset'	**Continuous Variable**		0.04	0.25		-0.06
English as an additional language (EAL): No	**Missing**	-0.95	0.47	0.04	*	-1.48
	EAL	0.20	0.07	0.00	*	0.30
Development Problems: None	**Missing**	0.32	0.32	0.31		0.50
	At least one	-0.10	0.04	0.01	*	-0.15
	More than one	-0.26	0.12	0.03	*	-0.40
Behavioural Problems: None	**At least one**	-0.21	0.04	0.00	*	-0.33
	More than one	0.00	0.09	0.97		0.00
Father's Highest Qualification: None	**Missing**	-0.40	0.24	0.09		-0.63
	Vocational	0.00	0.05	0.95		0.00
	16 academic	0.06	0.04	0.19		0.09
	18 academic	0.05	0.06	0.40		0.08
	Degree or equivalent	0.05	0.06	0.36		0.08
	Higher degree	0.17	0.08	0.03	*	0.27
	Other professional	-0.20	0.12	0.12		-0.31
	Father absent	0.02	0.04	0.59		0.03
Eligibility for Free School Meals (FSM): None	**Missing**	0.01	0.08	0.87		0.02
	No FSM	-0.14	0.03	0.00	*	-0.21
Birth weight: Normal	**Birth weight: Missing**	0.07	0.10	0.48		0.11
	Birth weight: very low<=1500g	-0.15	0.11	0.15		-0.24
	Birth weight: low 1501-2500g	-0.10	0.05	0.03	*	-0.16

Mother's Highest Qualification: Highest	**Missing**	0.04	0.10	0.70		0.06
	Vocational	0.01	0.05	0.78		0.02
	16 academic	0.08	0.04	0.04	*	0.12
	18 academic	0.01	0.06	0.81		0.02
	Degree or equivalent	0.23	0.06	0.00	*	0.36
	Higher degree	0.08	0.08	0.32		0.13
	Other professional	0.28	0.11	0.01	*	0.44
Eligibility for Free School Meals (FSM): None	**Missing**	0.01	0.08	0.87		0.02
	No FSM	-0.14	0.03	0.00	*	-0.21
Number of siblings: singleton	**Missing**	0.11	0.21	0.59		0.18
	Siblings 1-2	0.12	0.03	0.00	*	0.18
	Siblings 3+	0.06	0.04	0.17		0.09
Ethnicity: White UK Heritage	**White European Heritage**	0.01	0.07	0.85		0.02
	Black Caribbean Heritage	0.02	0.07	0.77		0.03
	Black African Heritage	0.19	0.09	0.05	*	0.29
	Any other ethnic minority Heritage	-0.01	0.09	0.87		-0.02
	Indian Heritage	0.09	0.10	0.39		0.13
	Pakistani Heritage	0.17	0.08	0.04	*	0.26
	Bangladeshi Heritage	-0.16	0.14	0.23		-0.25
	Mixed Race Heritage	-0.01	0.05	0.82		-0.02
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-0.28	0.10	0.00	*	-0.44
	0-13	-0.27	0.06	0.00	*	-0.23
	14-19	-0.15	0.05	0.00	*	-0.10
	20-24	-0.19	0.05	0.00	*	-0.10
	25-32	-0.06	0.04	0.16		-0.03
KS1 Mobility: Non-mobility	**missing**	-0.17	0.14	0.24		-0.07
	One move	-0.05	0.03	0.10		-0.02
	Two or more moves	0.01	0.05	0.82		0.00

Table E.1.3: Model Properties for 'Independence and Concentration' at Reception: Null, Demographic and Two Mobility Groups Models (N = 2559)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	3.54	2.31	2.32
Level 2 Variance	.66	.50	.50
Level 1 Variance	.03	.03	.03
-2 LLR	-6289	-5672	-5663

Table E.1.4: for 'Independence and Concentration' at Reception Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	S.E.	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.02	0.00	0.00	*	0.25
Gender: Boys	**Gender: Girls**	0.25	0.03	0.00	*	0.39
'Co-operation & Conformity'	**Continuous Variable**	0.53	0.05	0.00	*	0.71
'Peer Sociability'	**Continuous Variable**	0.03	0.05	0.46		0.05
'Confidence'	**Continuous Variable**	-0.02	0.04	0.60		-0.03
'Anti-social' behaviour	**Continuous Variable**	-0.08	0.05	0.10		-0.10
'Worried/upset'	**Continuous Variable**	-0.06	0.04	0.15		-0.08
English as an additional language (EAL): No	**EAL: Yes**	0.04	0.06	0.50		0.06
Development Problems: None	**Missing**	-0.36	0.44	0.42		-0.55
	At least one	-0.11	0.05	0.02	*	-0.17
	More than one	-0.29	0.14	0.03	*	-0.45
Father's Qualification: None	**Missing**	0.17	0.37	0.64		0.27
	Vocational	-0.02	0.06	0.75		-0.03
	16 academic	0.05	0.05	0.35		0.08
	18 academic	0.04	0.07	0.55		0.06
	Degree or equivalent	0.08	0.06	0.22		0.12
	Higher degree	0.29	0.09	0.00	*	0.44
	Other professional	-0.18	0.15	0.22		-0.28
	Father absent	0.05	0.05	0.27		0.09
Mother's Qualification: Highest	**Missing**	0.08	0.15	0.58		0.13
	Vocational	0.10	0.05	0.07		0.15
	16 academic	0.10	0.05	0.03	*	0.15
	18 academic	0.00	0.06	0.96		0.00
	Degree or equivalent	0.24	0.07	0.00	*	0.38
	Higher degree	0.11	0.10	0.24		0.18
	Other professional	0.37	0.13	0.00	*	0.57
Eligibility for Free School Meals (FSM): None	**Missing**	0.01	0.10	0.89		0.02
	No FSM	-0.09	0.04	0.03	*	-0.14

Birth weight: Normal	**Birth weight: Missing**	0.18	0.13	0.15		0.29
	Birth weight: very low<=1500g	-0.34	0.12	0.00	*	-0.52
	Birth weight: low 1501-2500g	-0.16	0.06	0.01	*	-0.25
Number of Siblings: singleton	**Missing**	-0.01	0.25	0.97		-0.01
	Siblings 1-2	0.09	0.04	0.02	*	0.14
	Siblings 3+	0.09	0.05	0.09		0.14
Frequency of Help Sought with Behavioural / Developmental Problems: None	**Missing**	0.00	0.00	.		0.00
	Help Sought Once	-0.10	0.03	0.00	*	-0.15
	Help Sought Twice	0.00	0.06	0.93		0.01
	Help Sought Three or more	-0.30	0.10	0.00	*	-0.46
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-0.42	0.12	0.00	*	-0.65
	0-13	-0.40	0.07	0.00	*	-0.63
	14-19	-0.24	0.05	0.00	*	-0.38
	20-24	-0.27	0.05	0.00	*	-0.43
	25-32	-0.12	0.05	0.01	*	-0.19
KS1 Mobility: Non-mobility	**At least One Move**	-0.02	0.03	0.55		-0.03

Table E.1.5: Model Properties for Peer Sociability at Reception: Null, Demographic and Two Mobility Groups Models (N = 2565)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	3.65	2.67	2.66
Level 2 Variance	.48	.41	.41
Level 1 Variance	.03	.02	.02
-2 LLR	-5509	-5149	-5154

Table E.1.6: for Peer Sociability at Reception Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	S.E.	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.02	0.00	0.00	*	0.19
'Co-operation & conformity'	**Continuous Variable**	-0.03	0.05	0.47		-0.04
'Peer sociability'	**Continuous Variable**	0.36	0.04	0.00	*	0.54
'Confidence'	**Continuous Variable**	0.18	0.04	0.00	*	0.27
'Anti-social' behaviour	**Continuous Variable**	0.09	0.04	0.04	*	0.11
'Worried/ upset'	**Continuous Variable**	-0.07	0.04	0.07		-0.10
Family socio-economic status (SES): Professional non-manual	**Missing**	-0.15	0.20	0.45		-0.24
	Other professional non-manual	-0.05	0.05	0.31		-0.08
	Skilled non-manual	-0.06	0.05	0.25		-0.09
	Skilled manual	-0.08	0.06	0.18		-0.12
	Semi-skilled	-0.20	0.06	0.00	*	-0.31
	Unskilled	-0.10	0.10	0.33		-0.16
	Unemployed: not working	-0.22	0.10	0.03	*	-0.35
Development Problems: None	**Missing**	0.54	0.70	0.44		0.85
	At least one	-0.12	0.04	0.00	*	-0.18
	More than one	-0.15	0.12	0.22		-0.23
Behavioural Problems: None	**At least one**	-0.11	0.04	0.01	*	-0.18
	More than one	0.13	0.09	0.16		0.20
Father's Employment Status: Employed full time	**Missing**	-0.95	0.72	0.19		-1.50
	Not employed	-0.11	0.05	0.02	*	-0.17
	Employed part time	0.01	0.08	0.93		0.01
	Self-employed	0.01	0.04	0.83		0.01
	Father absent	0.01	0.04	0.86		0.01
Number of Siblings: singleton	**Missing**	0.25	0.23	0.29		0.39
	Siblings 1-2	0.00	0.03	0.96		0.00
	Siblings 3 +	-0.05	0.05	0.29		-0.08

Ethnicity: White UK Heritage	**White European Heritage**	-0.03	0.07	0.65		-0.05
	Black Caribbean Heritage	0.00	0.07	0.97		0.00
	Black African Heritage	0.11	0.10	0.25		0.17
	Any other ethnic minority Heritage	-0.02	0.08	0.81		-0.03
	Indian Heritage	-0.14	0.10	0.19		-0.21
	Pakistani Heritage	-0.18	0.09	0.06		-0.28
	Bangladeshi Heritage	-0.57	0.17	0.00	*	-0.89
	Mixed Race Heritage	0.03	0.05	0.59		0.05
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	0.07	0.11	0.51		0.11
	0-13	-0.15	0.06	0.01	*	-0.24
	14-19	-0.09	0.05	0.07		-0.14
	20-24	-0.11	0.05	0.02	*	-0.17
	25-32	-0.06	0.04	0.19		-0.09
Pre-School mobility	**At least one move**	0.02	0.03	0.51		0.03

Table E.1.7: Model Properties for Anti-social Behaviour at Reception: Null, Demographic and Two Mobility Groups Models (N = 2564)

	Null Model	Model 1: Demographic	Model 2: Mobility
Intercept	1.74	1.89	1.88
Level 2 Variance	.41	.34	.34
Level 1 Variance	.022	.02	.02
-2 LLR	5091	4725	4730

Table E.1.8: for Anti-social Behaviour at Reception Two Mobility Groups: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	S.E.	P>z	Sig	Effect Sizes
Age at test	**Continuous Variable**	0.01	0.00	0.00	*	0.12
Gender: Boys	**Gender: Girls**	-0.02	0.02	0.46		-0.03
'Co-operation & Conformity'	**Continuous Variable**	-0.45	0.04	0.00	*	-0.60
'Peer sociability'	**Continuous Variable**	0.00	0.04	0.92		0.01
'Confidence'	**Continuous Variable**	0.22	0.04	0.00	*	0.34
'Anti-social' behaviour	**Continuous Variable**	0.21	0.04	0.00	*	0.25
'Worried/upset'	**Continuous Variable**	0.07	0.04	0.06		0.09
English as an additional language (EAL): No	**Missing**	0.06	0.03	0.03	*	0.10
	EAL	0.15	0.04	0.00	*	0.23
Family socio-economic status (SES): Professional non-manual	**Missing**	0.05	0.19	0.79		0.08
	Other professional non-manual	-0.01	0.05	0.90		-0.01
	Skilled non-manual	0.05	0.05	0.30		0.07
	Skilled manual	0.02	0.05	0.74		0.03
	Semi-skilled	0.00	0.06	0.99		0.00
	Unskilled	0.01	0.09	0.88		0.02
	Unemployed: not working	0.05	0.10	0.57		0.08
Development Problems: None	**Missing**	-0.37	0.64	0.56		-0.58
	At least one	0.00	0.04	0.99		0.00
	More than one	0.16	0.11	0.15		0.25
Behavioural Problems: None	**At least one**	0.14	0.04	0.00	*	0.22
	More than One	-0.01	0.08	0.92		-0.01
Father's Employment Status: Employed full time	**Missing**	0.57	0.89	0.52		0.89
	Not employed	-0.05	0.04	0.23		-0.08
	Employed part time	-0.15	0.08	0.06		-0.23
	Self-employed	0.02	0.04	0.62		0.03
	Father absent	0.02	0.04	0.53		0.03

Number of Siblings: singleton	**Missing**	0.00	0.21	0.99		0.00
	Siblings 1 -2	-0.11	0.03	0.00	*	-0.17
	Siblings 3 +	-0.11	0.04	0.01	*	-0.17
None Parental Care Givers: None	**Missing**	0.00	0.00	.		0.00
	One	0.03	0.03	0.29		0.05
	Two	0.03	0.04	0.45		0.04
	Three +	0.06	0.05	0.17		0.10
Ethnicity: White UK Heritage	**White European Heritage**	0.02	0.07	0.80		0.03
	Black Caribbean Heritage	-0.04	0.07	0.58		-0.06
	Black African Heritage	0.06	0.09	0.47		0.10
	Any other ethnic minority Heritage	0.10	0.08	0.18		0.16
	Indian Heritage	-0.10	0.10	0.29		-0.16
	Pakistani Heritage	-0.25	0.09	0.00	*	-0.39
	Bangladeshi Heritage	-0.15	0.16	0.34		-0.23
	Mixed Race Heritage	-0.01	0.05	0.85		-0.01
None Parental Care Givers: None	**Missing**	0.00	0.00	.		0.00
	One	0.03	0.03	0.29		0.05
	Two	0.03	0.04	0.45		0.04
	Three +	0.06	0.05	0.17		0.10
Duration at pre-school centre: Greater than 36 months	**0 - 12**	-0.04	0.05	0.48		-0.06
	12 - 24	0.03	0.05	0.50		0.05
	24 - 36	0.01	0.05	0.89		0.01
Regular bedtime	**Missing**	-0.25	0.60	0.67		-0.40
	No regular Bedtime	-0.08	0.03	0.02	*	-0.13
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	0.16	0.10	0.11		0.26
	0-13	0.15	0.06	0.01	*	0.23
	14-19	0.05	0.05	0.26		0.08
	20-24	0.06	0.04	0.14		0.10
	25-32	0.01	0.04	0.83		0.01
Have not Moved During Year One	**One move**	0.00	0.03	0.90		0.01

Table E.1.9: Model Properties for 'Co-operation & Conformity' at Reception: Null, Demographic and Four Mobility Groups Models (N = 2565)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	3.91	2.02	2.97
Level 2 Variance	.44	.34	.34
Level 1 Variance	.025	.091	.018
-2 LLR	-5296	-4738	-4744

Table E.1.10: Model Properties for 'Independence & Concentration' at Reception: Null, Demographic and Four Mobility Groups Models (N = 2559)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	3.53	2.31	2.32
Level 2 Variance	.66	.49	.49
Level 1 Variance	.029	.03	.029
-2 LLR	-6289	-5658	-5663

Table E.1.11: Model Properties for Peer Sociability at Reception: Null, Demographic and Four Mobility Groups Models (N = 2565)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	3.65	2.68	2.37
Level 2 Variance	.48	.40	.40
Level 1 Variance	.023	.018	.018
-2 LLR	-5509	-3995	-4006

Table E.1.12: Model Properties for 'Anti-social' behaviour at Reception: Null, Demographic and Four Mobility Groups Models (N = 2564)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.74	1.92	1.99
Level 2 Variance	.41	.32	.32
Level 1 Variance	.021	.014	0.13
-2 LLR	-5091	-3598	-3508

Table E.2.1: Model Properties for 'Self-regulation' at KS1: Null, Demographic and Two Mobility Groups Models (N = 2238)

	Null Model	Model 1: Demographic	Model 2: 2 Group Mobility
Intercept	2.50	1.82	1.84
Level 2 Variance	.21	.16	.16
Level 1 Variance	.01	.01	.01
-2 LLR	-2888	-2554	-2545

Table E.2.2: 'Self-regulation' at KS1: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Std. Err	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.01	0.00	0.02	*	0.20
Gender: Boys	**Gender: Girls**	0.10	0.02	0.14		0.24
'Independence & Concentration'	**Continuous Variable**	0.19	0.02	0.23		0.77
'Co-operation & Conformity'	**Continuous Variable**	0.07	0.03	0.13		0.21
'Peer Sociability'	**Continuous Variable**	0.02	0.02	0.06		0.07
'Anti-social' behaviour	**Continuous Variable**	0.00	0.02	0.04	*	-0.01
'Peer Empathy'	**Continuous Variable**	-0.01	0.02	0.03	*	-0.04
'Confidence'	**Continuous Variable**	0.02	0.02	0.06		0.07
Development Problems: None	**Missing**	0.42	0.19	0.79		1.02
	At least one	-0.02	0.03	0.03	*	-0.05
	More than one	-0.02	0.08	0.14		-0.04
Behavioural Problems: None	**Missing**	0.00	0.00	.		0.00
	Present	-0.06	0.03	0.00	*	-0.14
		-0.14	0.06	-0.01	*	-0.33
Family socio-economic status (SES): Professional non-manual	**Missing**	-0.32	0.14	-0.04	*	-0.76
	Other professional non-manual	-0.10	0.04	-0.03	*	-0.25
	Skilled non-manual	-0.12	0.04	-0.04	*	-0.28
	Skilled manual	-0.17	0.05	-0.08	*	-0.41
	Semi-skilled	-0.17	0.05	-0.08	*	-0.40
	Unskilled	-0.22	0.08	-0.07	*	-0.52
	Unemployed: not working	-0.11	0.07	0.04	*	-0.26
Mother's Highest Qualification: Highest	**Missing**	-0.01	0.09	0.17		-0.02
	Vocational	0.01	0.03	0.08		0.02
	16 academic	0.06	0.03	0.11		0.14
	18 academic	0.08	0.04	0.16		0.18
	Degree or equivalent	0.09	0.04	0.17		0.21
	Higher degree	0.04	0.06	0.16		0.11
	Other professional	0.23	0.08	0.40		0.56

Eligibility for Free School Meals (FSM): None	**Missing**	-0.04	0.03	0.01	*	-0.09
	No FSM	-0.08	0.03	-0.02	*	-0.18
Birth weight: Normal	**Birth weight: Missing**	-0.10	0.08	0.06		-0.23
	Birth weight: very low<=1500g	-0.14	0.07	0.01	*	-0.33
	Birth weight: low 1501-2500g	-0.05	0.04	0.02	*	-0.13
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-0.09	0.08	0.06		-0.22
	0-13	-0.05	0.04	0.03	*	-0.13
	14-19	-0.10	0.03	-0.03		-0.24
	20-24	-0.07	0.03	-0.01		-0.17
	25-32	-0.04	0.03	0.01		-0.11
KS1 Mobility: Non-mobility	**At least one move during KS1**	-0.08	0.03	-0.02		-0.18

Table E.2.3: Model Properties for 'Pro-social' behaviour at KS1: Null, Demographic and Two Mobility Groups Models (N = 2238)

	Null Model	Model 1: Demographic	Model 2: 2 Group Mobility
Intercept	2.36	1.42	1.39
Level 2 Variance	.25	.17	.17
Level 1 Variance	.01	.01	.01
-2 LLR	3297	2676	2674

Table E.2.4: 'Pro-social' behaviour at KS1: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Sd. Err	P>z	Sig	Effect Sizes
Age at test	**Continuous Variable**	0.00	0.00	0.98		0.00
Gender: Boys	**Gender: Girls**	0.16	0.02	0.00	*	0.56
'Independence & Concentration'	**Continuous Variable**	0.04	0.02	0.04	*	0.16
'Co-operation & Conformity'	**Continuous Variable**	0.07	0.03	0.01	*	0.24
'Peer Sociability'	**Continuous Variable**	0.01	0.02	0.68		0.03
'Anti-social' behaviour	**Continuous Variable**	-0.05	0.02	0.01	*	-0.17
'Peer Empathy'	**Continuous Variable**	0.07	0.02	0.00	*	0.28
'Confidence'	**Continuous Variable**	0.01	0.02	0.73		0.02
Eligibility for Free School Meals (FSM): None	**Missing**	-0.06	0.03	0.02	*	-0.15
	No FSM	-0.06	0.03	0.02	*	-0.16
Mother's Employment: Not Working	**Missing**	-0.05	0.12	0.68		-0.12
	Employed full time	-0.04	0.03	0.14		-0.10
	Employed part time	0.01	0.02	0.68		0.02
	Self-employed	0.00	0.05	0.92		-0.01
Family Socio Economic Status: Professional non-manual	**Missing**	-0.24	0.14	0.08		-0.60
	Other professional non-manual	0.02	0.03	0.60		0.04
	Skilled non-manual	0.00	0.03	0.91		0.01
	Skilled manual	0.00	0.04	0.94		0.01
	Semi-skilled	-0.02	0.04	0.61		-0.05
	Unskilled	-0.01	0.07	0.93		-0.01
	Unemployed: not working	-0.09	0.07	0.17		-0.23
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-0.03	0.07	0.70		-0.07
	0-13	-0.03	0.04	0.46		-0.08
	14-19	-0.04	0.03	0.20		-0.11
	20-24	-0.02	0.03	0.47		-0.06
	25-32	-0.01	0.03	0.68		-0.03

Behavioural Problems: None	**Missing**	0.30	0.19	0.11		0.74
	One	-0.03	0.03	0.34		-0.07
	More than one	-0.10	0.06	0.10		-0.26
Ethnicity: White UK Heritage	**White European Heritage**	-0.04	0.05	0.35		-0.11
	Black Caribbean Heritage	0.04	0.05	0.45		0.09
	Black African Heritage	0.04	0.07	0.55		0.10
	Any Other Ethnic Minority Heritage	0.03	0.06	0.59		0.08
	Indian Heritage	0.06	0.07	0.36		0.16
	Pakistani Heritage	0.02	0.06	0.78		0.04
	Bangladeshi Heritage	0.05	0.11	0.62		0.13
	Mixed Race Heritage	-0.02	0.04	0.68		-0.04
KS1 Mobility: Non-mobility	**At least one move during KS1**	-0.10	0.03	0.00	*	-0.25

Table E.2.5: Model Properties for 'Anxious' behaviour at KS1: Null, Demographic and Two Mobility Groups Models (N = 2243)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.29	1.50	1.45
Level 2 Variance	.141	.139	.137
Level 1 Variance	.005	.004	.004
-2 LLR	2047	2035	2040

Table E.2.6 'Anxious' behaviour at KS1: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Std. Err	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.00	0.00	0.31		-0.04
Gender: Boys	**Gender: Girls**	0.04	0.02	0.03	*	0.10
'Independence & Concentration'	**Continuous Variable**	-0.02	0.02	0.27		-0.08
'Co-operation & Conformity'	**Continuous Variable**	0.01	0.03	0.61		0.05
'Peer Sociability'	**Continuous Variable**	-0.09	0.02	0.00	*	-0.36
'Anti-social' behaviour	**Continuous Variable**	0.04	0.02	0.03	*	0.14
'Peer Empathy'	**Continuous Variable**	0.03	0.02	0.16		0.11
'Confidence'	**Continuous Variable**	0.01	0.02	0.57		0.04
Mother's Employment: Not Working	**Missing**	0.23	0.11	0.03	*	0.63
	Employed full time	-0.09	0.02	0.00	*	-0.23
	Employed part time	-0.03	0.02	0.13		-0.08
	Self-employed	0.00	0.04	0.90		-0.01
Behavioural Problems: None	**Missing**	-0.20	0.13	0.12		-0.54
	At least one	0.04	0.03	0.14		0.11
	More than one	0.07	0.06	0.22		0.19
KS1 Mobility: Non-mobility	**At least one move during KS1**	0.01	0.02	0.53		0.04

Table E.2.7: Model Properties for 'Anti-social' behaviour at KS1: Null, Demographic and Two Mobility Groups Models (N = 2244)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.28	1.38	1.45
Level 2 Variance	.13	.10	.10
Level 1 Variance	.004	.003	.003
-2 LLR	1817	1345	1348

Table E.2.8: 'Anti-social' behaviour at KS1: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Std. Err	P>z	Sig	Effect Size
Gender: Boys	**Gender: Girls**	-0.10	0.01	0.00	*	-0.32
'Independence & Concentration'	**Continuous Variable**	-0.04	0.01	0.00	*	-0.24
'Co-operation & Conformity'	**Continuous Variable**	-0.12	0.02	0.00	*	-0.53
'Peer Sociability'	**Continuous Variable**	0.03	0.01	0.02	*	0.15
'Anti-social' behaviour	**Continuous Variable**	0.09	0.02	0.00		0.37
'Peer Empathy'	**Continuous Variable**	-0.01	0.02	0.61	*	-0.04
'Confidence'	**Continuous Variable**	0.04	0.01	0.00	*	0.20
Eligibility for Free School Meals (FSM): None	**Missing**	0.06	0.02	0.00		0.18
	No FSM	0.07	0.02	0.00		0.22
Family socio-economic status: Professional non-manual	**Missing**	0.06	0.11	0.60		0.18
	Other professional non-manual	0.02	0.03	0.43	*	0.07
	Skilled non-manual	0.02	0.03	0.48	*	0.07
	Skilled manual	0.06	0.03	0.06		0.21
	Semi-skilled	0.04	0.04	0.31	*	0.12
	Unskilled	0.09	0.06	0.14		0.28
	Unemployed: not working	0.12	0.06	0.03		0.39
Mother's Employment: Not Working	**Missing**	0.40	0.14	0.00		1.31
	Employed full time	0.05	0.02	0.01		0.17
	Employed part time	0.01	0.02	0.42	*	0.04
	Self-employed	0.02	0.03	0.59	*	0.06
Mother's Highest Qualification: Highest	**Missing**	-0.08	0.09	0.34	*	-0.26
	Vocational	0.03	0.03	0.26	*	0.09
	16 academic	-0.02	0.02	0.30	*	-0.07
	18 academic	-0.03	0.03	0.27	*	-0.11
	Degree or equivalent	-0.02	0.03	0.43	*	-0.08
	Higher degree	-0.01	0.04	0.79	*	-0.04
	Other professional	0.00	0.06	0.98	*	0.00

Marital Status: Married	**Missing**	-0.15	0.08	0.08	*	-0.47
	Single	0.05	0.02	0.03	*	0.15
	Live with Partner	0.03	0.02	0.16	*	0.09
	Separated/ divorced	0.02	0.02	0.47	*	0.05
Behavioural Problems: None	**Missing**	-0.19	0.15	0.20	*	-0.61
	At least one	0.07	0.02	0.00		0.24
	More than one	0.12	0.05	0.01		0.38
Birth weight: Normal	**Birth weight: Missing**	0.09	0.06	0.15		0.28
	Birth weight: very low<=1500g	0.10	0.06	0.08		0.32
	Birth weight: low 1501-2500g	0.03	0.03	0.29	*	0.09
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	0.00	0.06	0.98	*	-0.01
	0-13	0.00	0.03	0.92	*	-0.01
	14-19	0.05	0.03	0.07	*	0.15
	20-24	0.00	0.02	0.94	*	0.01
	25-32	0.02	0.02	0.37		0.07
KS1 Mobility: Non-mobility	**At least one move during KS1**	0.04	0.02	0.06		0.12

Table E.2.9: Model Properties for 'Self-regulation' at KS1: Null, Demographic and Four Mobility Groups Models (N = 2238)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	2.36	1.41	1.37
Level 2 Variance	.24	.17	.17
Level 1 Variance	.012	.009	.009
-2 LLR	3297	-2676	-2678

Table E.2.10: Model Properties for 'Pro-social' behaviour at KS1: Null, Demographic and Four Mobility Groups Models (N = 2238)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	2.49	1.81	1.77
Level 2 Variance	.20	.16	.16
Level 1 Variance	.01	.01	.01
-2 LLR	-2888	-2499	-2498

Table E.2.11: Model Properties for 'Anxious' behaviour at KS1: Null, Demographic and Four Mobility Groups Models (N = 2243)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.29	1.40	1.41
Level 2 Variance	.14	.13	.13
Level 1 Variance	.005	.004	.004
-2 LLR	-2043	-2140	-2155

Table E.2.12: Model Properties for 'Anti-social' behaviour at KS1: Null, Demographic and Two Mobility Groups Models (N = 2244)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.28	1.45	1.47
Level 2 Variance	.12	.09	.09
Level 1 Variance	.004	.003	.002
-2 LLR	-1817	-1305	-1317

Table E.3.1: Model Properties for 'Self-regulation' at KS2: Null, Demographic and Two Mobility Groups Models (N =2075)

	Null Model	Model 1: Demographic	Model 2: 2 Group Mobility
Intercept	2.350	1.179	1.202
Level 2 Variance	0.191	0.126	0.125
Level 1 Variance	0.031	0.022	0.021
-2 LLR	-1378	-1016	-1014

Table E. 3.2: 'Self-regulation' at KS2: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Std. Err	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.00	0.00	0.24		0.06
Gender	**Gender: Girls**	0.08	0.02	0.00	*	0.21
'Self-regulation' Year 2	**Continuous Variable**	0.43	0.02	0.00	*	1.14
Ethnicity: White UK Heritage	**White European Heritage**	-0.08	0.05	0.07		-0.24
	Black Caribbean Heritage	0.00	0.04	0.91		-0.01
	Black African Heritage	0.04	0.07	0.54		0.11
	Any Other Ethnic Minority Heritage	0.00	0.05	0.98		0.00
	Indian Heritage	-0.02	0.06	0.73		-0.06
	Pakistani Heritage	0.01	0.06	0.89		0.02
	Bangladeshi Heritage	0.12	0.11	0.26		0.35
	Mixed Race Heritage	-0.04	0.04	0.31		-0.11
Birth weight: Normal	**Missing**	0.16	0.07	0.03	*	0.45
	Birth weight: very low<=1500g	0.07	0.07	0.32		0.19
	Birth weight: low 1501-2500g	-0.02	0.03	0.54		-0.06
Development Problems: None	**At least one**	-0.08	0.03	0.00	*	-0.22
	More than one	-0.11	0.07	0.13		-0.30
Behavioural Problems: None	**At least one**	-0.04	0.03	0.13		-0.12
	More than one	-0.03	0.06	0.66		-0.07
English as an additional language (EAL): No	**EAL: Missing**	-0.06	0.04	0.11		-0.17
	EAL: Yes	-0.11	0.07	0.08		-0.32
Eligibility for Free School Meals (FSM): None	**FSM: Yes**	-0.08	0.03	0.00	*	-0.22
Salary: None	**Missing**	0.02	0.03	0.45		0.06
	2,500 – 17,499	0.04	0.03	0.22		0.10
	17,500 – 29,499	0.07	0.03	0.02	*	0.21
	30,000 – 37,499	0.07	0.04	0.06		0.19

Salary: None	**37,500 – 67,499**	0.06	0.03	0.05	*	0.18
	67,500 – 132,00+	0.03	0.04	0.53		0.08
Mother's Highest Qualifications: None	**Missing**	0.04	0.09	0.63		0.12
	Vocational	0.00	0.03	0.98		0.00
	16 academic	0.04	0.03	0.10		0.12
	18 academic	0.10	0.04	0.01	*	0.29
	Degree or equivalent	0.11	0.04	0.01	*	0.30
	Higher degree	0.15	0.06	0.01	*	0.41
	Other professional	0.04	0.07	0.64		0.10
Father's Highest Qualifications: None	**Missing**	0.04	0.03	0.21		0.12
	Vocational	0.04	0.03	0.16		0.12
	16 academic	0.08	0.04	0.06		0.21
	18 academic	0.11	0.04	0.01	*	0.30
	Degree or equivalent	0.10	0.05	0.07		0.27
	Higher degree	0.03	0.08	0.69		0.10
	Other professional	0.03	0.03	0.24		0.10
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-0.02	0.07	0.80		-0.05
	0-13	0.04	0.03	0.31		0.10
	14-19	0.01	0.03	0.86		0.02
	20-24	0.02	0.03	0.48		0.07
	25-32	0.07	0.04	0.10		0.19
KS2 Mobility: Non-mobility	**At least one move during KS2**	-0.07	0.02	0.00	*	-0.19

Table E.3.3: Model Properties for 'Pro-social' behaviour at KS2: Null, Demographic and Two Mobility Groups Models (N =2082)

	Null Model	Model 1: Demographic	Model 2: 2 Group Mobility
Intercept	2.47	1.54	1.56
Level 2 Variance	0.18	0.14	0.14
Level 1 Variance	0.04	0.03	0.03
-2 LLR	-1367	-1148	-1148

Table E.3.4: 'Pro-social' behaviour at KS2: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Std. Err	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.00	0.00	0.54		0.03
Gender	**Gender: Girls**	0.20	0.02	0.00	*	0.53
'Self-regulation' Year 2	**Continuous Variable**	0.31	0.02	0.00	*	0.78
Ethnicity: White UK Heritage	**White European Heritage**	0.00	0.00	0.54		0.03
	Black Caribbean Heritage	0.20	0.02	0.00	*	0.53
	Black African Heritage	-0.09	0.05	0.08		-0.24
	Any Other Ethnic Minority Heritage	-0.12	0.05	0.01	*	-0.31
	Indian Heritage	-0.05	0.07	0.49		-0.13
	Pakistani Heritage	-0.08	0.06	0.18		-0.21
	Bangladeshi Heritage	-0.06	0.07	0.40		-0.15
	Mixed Race Heritage	-0.01	0.06	0.84		-0.03
Development Problems: None	**At least one**	-0.01	0.12	0.92		-0.03
	More than one	-0.06	0.04	0.17		-0.15
Salary: None	**Missing**	-0.03	0.03	0.32		-0.08
	2,500 – 17,499	0.00	0.06	0.94		-0.01
	17,500 – 29,499	0.01	0.03	0.73		0.03
	30,000 – 37,499	0.02	0.03	0.49		0.06
	37,500 – 67,499	0.07	0.03	0.04	*	0.18
	67,500 – 132,00+	0.05	0.04	0.21		0.12
Mother's Highest Qualifications: None	**Missing**	0.05	0.03	0.14		0.13
	Vocational	0.03	0.05	0.51		0.08
	16 academic	0.00	0.09	0.99		0.00
	18 academic	0.05	0.03	0.16		0.12
	Degree or equivalent	0.06	0.03	0.03	*	0.16
	Higher degree	0.09	0.04	0.03	*	0.24
	Other professional	0.10	0.04	0.01	*	0.27

Mother's Marital Status from Baseline to KS1: Couple-Couple	**Missing**	0.08	0.05	0.11		0.22
	Single-Single	0.10	0.08	0.21		0.26
	Single-Couple	-0.57	0.29	0.05		-1.49
	Couple-Single	-0.03	0.02	0.25		-0.07
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	-0.08	0.03	0.02	*	-0.20
	0-13	-0.08	0.12	0.48		-0.22
	14-19	-0.04	0.08	0.60		-0.11
	20-24	0.01	0.04	0.77		0.03
	25-32	0.00	0.04	0.98		0.00
KS2 Mobility: Non-mobility	**At least one move during KS2**	-0.05	0.02	0.02	*	-0.14

Table E.3.5: Model Properties for 'Hyperactivity' at KS2: Null, Demographic and Two Mobility Groups Models (N =2079)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.60	1.02	1.01
Level 2 Variance	0.17	0.10	0.10
Level 1 Variance	0.02	0.01	0.01
-2 LLR	-1201	-784	-784

Table E.3.6: 'Hyperactivity' at KS2: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	S.E.	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.00	0.00	0.81		-0.01
Gender	**Gender: Girls**	-0.18	0.02	0.00	*	-0.56
'Hyperactivity' Year 2	**Continuous Variable**	0.44	0.02	0.00	*	1.17
Ethnicity: White UK Heritage	**White European Heritage**	0.03	0.04	0.48		0.09
	Black Caribbean Heritage	0.03	0.04	0.41		0.10
	Black African Heritage	-0.01	0.06	0.81		-0.04
	Any Other Ethnic Minority Heritage	0.03	0.05	0.49		0.11
	Indian Heritage	-0.02	0.06	0.75		-0.06
	Pakistani Heritage	-0.07	0.05	0.20		-0.21
	Bangladeshi Heritage	-0.11	0.10	0.24		-0.36
	Mixed Race Heritage	0.04	0.03	0.20		0.13
Behavioural Problems: None	**At least one**	0.05	0.03	0.04	*	0.16
	More than one	0.09	0.05	0.08		0.29
English as an additional language (EAL): No	**EAL: Missing**	0.11	0.03	0.00	*	0.34
	EAL: Yes	0.07	0.06	0.21		0.23
Eligibility for Free School Meals (FSM): None	**FSM: Yes**	0.03	0.02	0.26		0.09
Salary: None	**Missing**	0.05	0.05	0.27		0.16
	2,500 – 17,499	-0.01	0.03	0.73		-0.03
	17,500 – 29,499	-0.06	0.03	0.05	*	-0.18
	30,000 – 37,499	0.02	0.03	0.51		0.07
	37,500 – 67,499	-0.01	0.03	0.77		-0.03
	67,500 – 132,000+	0.03	0.04	0.43		0.10
Mother's Marital Status from recruitment to KS1: Couple-Couple	**Missing**	-0.05	0.04	0.23		-0.17
	Single-Single	0.01	0.03	0.73		0.03
	Single-Couple	0.01	0.04	0.89		0.02
	Couple-Single	0.00	0.02	0.88		0.01

Mother's Highest Qualifications: None	**Missing**	0.07	0.08	0.35		0.23
	Vocational	-0.07	0.03	0.01	*	-0.23
	16 academic	-0.09	0.02	0.00	*	-0.27
	18 academic	-0.13	0.03	0.00	*	-0.39
	Degree or equivalent	-0.11	0.03	0.00	*	-0.34
	Higher degree	-0.13	0.05	0.01	*	-0.40
	Other professional	-0.23	0.07	0.00	*	-0.73
Father's Highest Qualifications: None	**Missing**	0.00	0.03	0.88		0.01
	Vocational	-0.01	0.03	0.58		-0.05
	16 academic	-0.01	0.04	0.71		-0.04
	18 academic	-0.09	0.03	0.01	*	-0.28
	Degree or equivalent	-0.05	0.05	0.28		-0.16
	Higher degree	0.07	0.07	0.33		0.22
	Other professional	0.03	0.03	0.37		0.08
Early years Home Learning Environment (HLE) Index: Highest	**Missing**	0.02	0.06	0.72		0.07
	0-13	-0.02	0.03	0.44		-0.07
	14-19	-0.02	0.03	0.55		-0.06
	20-24	-0.02	0.03	0.47		-0.07
	25-32	-0.01	0.04	0.71		-0.04
KS2 Mobility: Non-mobility	**At least one move during KS2**	0.04	0.02	0.02	*	0.13

Table E.3.7: Model Properties for 'Anti-social' behaviour at KS2: Null, Demographic and Two Mobility Groups Models (N =2077

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.11	0.73	0.73
Level 2 Variance	0.05	0.04	0.04
Level 1 Variance	0.01	0.00	0.00
-2 LLR	23	221	223

Table E.3.8: 'Anti-social' behaviour at KS2: coefficients, error, p values, and effect sizes

Reference Group	Categories	Coeff	Std. Err	P>z	Sig	Effect Size
Age at test	**Continuous Variable**	0.00	0.00	0.46		0.03
Gender	**Gender: Girls**	-0.06	0.01	0.00	*	-0.30
'Anti-social' behaviour Year 2	**Continuous Variable**	0.33	0.02	0.00	*	0.76
Ethnicity: White UK Heritage	**White European Heritage**	-0.01	0.03	0.75		-0.04
	Black Caribbean Heritage	0.07	0.02	0.01	*	0.32
	Black African Heritage	-0.06	0.04	0.09		-0.30
	Any Other Ethnic Minority Heritage	-0.01	0.03	0.63		-0.07
	Indian Heritage	-0.04	0.03	0.21		-0.20
	Pakistani Heritage	0.00	0.03	0.90		-0.02
	Bangladeshi Heritage	-0.04	0.06	0.49		-0.20
	Mixed Race Heritage	0.02	0.02	0.41		0.08
Behavioural Problems: None	**At least one**	0.01	0.02	0.35		0.07
	More than one	0.00	0.03	0.97		0.01
Eligibility for Free School Meals (FSM): None	**FSM: Yes**	0.04	0.02	0.01	*	0.21
Family socio-economic status (SES): Professional non-manual	**Other professional non-manual**	0.02	0.02	0.24		0.10
	Skilled non-manual	0.06	0.02	0.00	*	0.28
	Skilled manual	0.02	0.02	0.28		0.10
	Semi-skilled	0.06	0.02	0.02	*	0.28
	Unskilled	0.10	0.04	0.01	*	0.48
	Never Worked	0.04	0.02	0.06		0.20
	Missing	0.10	0.12	0.44		0.47
Mother's Marital Status from recruitment to KS1: Couple-Couple	**Missing**	0.01	0.01	0.45		0.05
	Single-Single	0.02	0.02	0.26		0.08
	Single-Couple	0.03	0.03	0.21		0.15
	Couple-Single	0.00	0.01	0.80		-0.02

Mother's Highest Qualifications: None	**Missing**	0.02	0.05	0.64		0.11
	Vocational	-0.01	0.02	0.64		-0.04
	16 academic	-0.02	0.01	0.27		-0.08
	18 academic	-0.02	0.02	0.31		-0.10
	Degree or equivalent	-0.02	0.02	0.36		-0.09
	Higher degree	-0.01	0.03	0.84		-0.03
	Other professional	-0.04	0.04	0.34		-0.19
KS2 Mobility: Non-mobility	**At least one move during KS2**	0.04	0.01	0.00	*	0.17

Table E.3.9: Model Properties for Self Regulation at KS2: Null, Demographic and Four Mobility Groups Models (N =2075)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	2.35	1.18	1.22
Level 2 Variance	0.19	0.13	0.13
Level 1 Variance	0.03	0.02	0.02
-2 LLR	-1378	-1016	-1018

Table E.3.10: Model Properties for 'Pro-social' behaviour at KS2: Null, Demographic and Four Mobility Groups Models (N =2082)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	2.47	1.54	1.57
Level 2 Variance	0.18	0.14	0.14
Level 1 Variance	0.04	0.03	0.03
-2 LLR	-1367	-1148	-1153

Table E.3.11: Model Properties for 'Hyperactivity' at KS2: Null, Demographic and Four Mobility Groups Models (N =2079)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.60	1.02	1.02
Level 2 Variance	0.17	0.10	0.10
Level 1 Variance	0.02	0.01	0.01
-2 LLR	-1201	-784	-788

Table E.3.12: Model Properties for 'Anti-social' behaviour at KS2: Null, Demographic and Two Mobility Groups Models (N =2077)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.11	0.73	0.73
Level 2 Variance	0.05	0.04	0.04
Level 1 Variance	0.01	0.00	0.00
-2 LLR	23	221	216

Table E.3.13: Model Properties for Self Regulation at KS2: Null, Demographic and Four Mobility Groups Models (N =2075)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	2.35	1.18	1.12
Level 2 Variance	0.19	0.13	0.12
Level 1 Variance	0.03	0.02	0.02
-2 LLR	-1378	-1016	-1017

Table E.3.14: Model Properties for 'Pro-social' behaviour at KS2: Null, Demographic and Four Mobility Groups Models (N =2082)

	Null Model	Model 1: Demographic	Model 2: 4 Group Mobility
Intercept	2.47	1.54	1.58
Level 2 Variance	0.18	0.14	0.14
Level 1 Variance	0.04	0.03	0.03
-2 LLR	-1367	-1148	-1149

Table E.3.15: Model Properties for 'Hyperactivity' at KS2: Null, Demographic and Four Mobility Groups Models (N =2079)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.60	1.02	1.01
Level 2 Variance	0.17	0.10	0.10
Level 1 Variance	0.02	0.01	0.01
-2 LLR	-1201	-784	-786

Table E.3.16: Model Properties for 'Anti-social' behaviour at KS2: Null, Demographic and Two Mobility Groups Models (N =2077)

	Null Model	Model 1: Demographic	Model 2: 4Group Mobility
Intercept	1.11	0.73	0.73
Level 2 Variance	0.05	0.04	0.04
Level 1 Variance	0.01	0.00	0.00
-2 LLR	23	221	221

Glossary of terms

Age standardised scores Assessment scores that have been adjusted to take account of the child's age at testing. This enables a comparison to be made between the performance of an individual child, and the relative achievement of a representative sample of children in the same age group throughout the country or, in this case, the relative achievement of the EPPE sample.

Baseline measures Assessments taken by the EPPE child at entry to the study. These assessment scores are subsequently employed as prior attainment measures in a value added analysis of EPPE 3-11 children's cognitive progress.

Birth weight Babies born weighing 2500 grams (5lbs 8oz) or less are defined as below normal birth weight, foetal infant classification is below 1000 grams, very low birth weight is classified as 1001-1005 grams and low birth weight is classified as 1501-2500 grams (Scott and Carran, 1989).

British Ability Scales (BAS) This is a battery of assessments specially developed by NFER-Nelson to assess very young children's abilities. The assessments used at entry to the EPPE study and entry to reception were:
Block building - Visual-perceptual matching, especially in spatial orientation (only entry to EPPE study)
Naming Vocabulary – Expressive language and knowledge of names
Pattern construction – Non-verbal reasoning and spatial visualisation (only entry to reception)
Picture Similarities – Non-verbal reasoning
Early number concepts – Knowledge of, and problem solving using pre-numerical and numerical concepts (only entry to reception)
Copying – Visual–perceptual matching and fine-motor co-ordination. Used specifically for children without English
Verbal comprehension – Receptive language, understanding of oral instructions involving basic language concepts.

Centre/School level variance The proportion of variance in a particular child outcome measure (i.e. Pre-reading scores at start of primary school) attributable to differences between individual centres/schools rather than differences between individual children.

***Child background* factors** Child background characteristics such as age, gender, and ethnicity.

***Confidence intervals at the 95%* level** A range of values which can be expected to include the 'true' value in 95 out of 100 samples (i.e. if the calculation was repeated using 100 random samples).

Contextualised models Cross-sectional multilevel models exploring children's cognitive attainment at entry to primary school, controlling for child, parent and home learning environment characteristics (but not prior attainment).

Controlling for Several variables may influence an outcome and these variables may themselves be associated. Multilevel statistical analyses can calculate the influence of one variable upon an outcome having allowed for the effects of other variables. When this is done the net effect of a variable upon an outcome controlling for other variables can be established.

Correlation A correlation is a measure of statistical association that ranges form + 1 to -1.

Duration In terms of the value added models, the duration of pre-school covers the time period between date of BAS assessment at entry to the EPPE study until entry to primary school. Note that the number of months of pre-school attended before the child entered the EPPE study is not included in this duration measure. A separate 'duration' measure of amount of time in pre-school prior to entering the study was tested but was not found to be significant (note that this 'duration' measure is confounded with prior attainment). In the contextualised models, duration of pre-school refers to the time period between entry to the target pre-school until entry to primary school. These duration measures provide a crude indication of length of pre-school experience.

ECERS-R and ECERS-E The American Early Childhood Environment Rating Scale (ECERS-R) (Harms et al., 1998) is based on child centred pedagogy and also assesses resources for indoor and outdoor play. The English rating scale (ECERS-E) (Sylva et al., 2003) was intended as a supplement to the ECERS-R and was developed specially for the EPPE study to reflect the Desirable Learning Outcomes (which have since been replaced by the Early Learning Goals), and more importantly the Curriculum Guidance for the Foundation Stage which at the time was in trial stage.

Educational effectiveness Research design which seeks to explore the effectiveness of educational institutions in promoting a range of child/student outcomes (often academic measures) while controlling for the influence of intake differences in child/student characteristics.

Effect sizes (ES) Effect sizes (ES) provide a measure of the strength of the relationships between different predictors and the child outcomes under study. For further discussion see Appendix 5 and Elliot & Sammons (2004).

Family factors Examples of family factors are mother's qualifications, father's employment and family SES.

General Cognitive Ability (GCA) A measure of children's overall cognitive ability, incorporating non-verbal and verbal BAS sub-scales.

Hierarchical nature of the data Data that clusters into pre-defined sub-groups or levels within a system (i.e. young children, pre-school centres, LAs).

Home learning environment (HLE) factors Measures derived from reports from parents (at interview) about what children do at home, for example, playing with numbers and letters, singing songs and nursery rhymes.

Intervention study A study in which researchers 'intervene' in the sample to control variables i.e. control by setting, the adult:child ratios in order to compare different specific ratios in different settings. EPPE is not an intervention study in that it investigates naturally occurring variation in pre-school settings.

Intra-centre/school correlation The intra-centre/school correlation measures the extent to which the scores of children in the same centre/school resemble each other as compared with those from children at different centres/schools. The intra-centre/school correlation provides an indication of the extent to which unexplained variance in children's progress (i.e. that not accounted for by prior attainment) may be attributed to differences between centres/schools. This gives an indication of possible variation in pre-school centre/school effectiveness.

Mobility Mobility, in the context of the present research, is defined as a within-phase change of pre-school or school; it is thus distinguished from changes due to school closure, amalgamation, or transfer across phases of schooling.

Model Fit: *The extent to which the model approximates the variance/co-variance of the data. The significance or otherwise of this figure is determined according to the degrees of freedom it is associated with – that is the difference in the number of predictors between the two models.*

Multiple Disadvantage Based on three child variables, six parent variables, and one related to the home learning environment which were considered 'risk' indicators when looked at in isolation. A child's 'multiple disadvantage' was calculated by summing the number of indicators the child was at risk on.

Multilevel modelling A methodology that allows data to be examined simultaneously at different levels within a system (i.e. young children, pre-school centres, LAs), essentially a generalisation of multiple regression.

Multiple regression A method of predicting outcome scores on the basis of the statistical relationship between observed outcome scores and one or more predictor variables.

Net effect The unique contribution of a particular variable upon an outcome while other variables are controlled.

Pre-reading attainment Composite formed by adding together the scores for phonological awareness (rhyme and alliteration) and letter recognition.

Prior attainment factors Measures which describe children's achievement at the beginning of the phase or period under investigation (i.e. taken on entry to primary or secondary school or, in this case, on entry to the EPPE study).

Quality Measures of pre-school centre quality collected through observational assessments (ECERS-R, ECERS-E and CIS) made by trained researchers.

Sampling profile/procedures The EPPE sample was constructed by:
- Five regions (six LAs) randomly selected around the country, but being representative of urban, rural, inner city areas.
- Pre-schools from each of the six types of target provision (nursery classes, nursery schools, local authority day nurseries, private day nurseries, play groups and integrated centres) randomly selected across the region.

Significance level Criteria for judging whether differences in scores between groups of children or centres might have arisen by chance. The most common criteria is the 95% level ($p<0.05$) which can be expected to include the 'true' value in 95 out of 100 samples (i.e. the probability being one in twenty that a difference might have arisen by chance).

Social/behavioural development A child's ability to 'socialise' with other adults and children and their general behaviour to others.

Socio Economic Status (SES) Occupational information was collected by means of a parental interview when children were recruited to the study. The Office of Population Census and Surveys OPCS (1995) Classification of Occupations was used to classify mothers and fathers current employment into one of eight groups: Professional non-manual I, Other professional non-manual II, Skilled non-manual III, Skilled manual III, Semi-skilled manual IV, Unskilled manual V, Never worked and no response. Family SES was obtained by assigning the SES classification based on the parent with the highest occupational status.

Standard deviation (sd) A measure of the spread around the mean in a distribution of numerical scores. In a normal distribution, 68% of cases fall within one standard deviation of the mean and 95% of cases fall within two standard deviations.

Total BAS score By combining four of the BAS sub-scales (two verbal and two non-verbal) a General Cognitive Ability score or Total BAS score at entry to the study can be computed. This is a measure of overall cognitive ability.

Value added models Longitudinal multilevel models exploring children's cognitive progress over the pre-school period, controlling for prior attainment and significant child, parent and home learning environment characteristics.

Value added residuals Differences between predicted and actual results for pre-school centres (where predicted results are calculated using value added models).